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ANNUAL REPORT

OF THE

MINNESOTA

ANY person may become and remain a member of this Society by the payment of the annual membership fee, $1.00. Each member is entitled to two copies of the current annual report and the back numbers of any years for which there is a surplus. Annual memberships expire at the opening of the annual meeting, third Tuesday in January. Address the Secretary, OLIVER GIBBS, Jr., Lake City, Minn.

PROCEEDINGS, ESSAYS, DISCUSSIONS AND REPORTS.

Compiled and Edited by the Secretary, Oliver Gibbs Jr., Lake City, Minn.

MINNEAPOLIS:
JOHNSON, SMITH & HARRISON.
1884.

LETTER OF TRANSMITTAL TO THE GOVERNOR.

SECRETARY'S OFFICE,
LAKE CITY, Jan. 31st, 1884.

Hon. L. F. Hubbard, Governor of Minnesota :

SIR : As required by the Act of the Legislature, session of 1883, I transmit to you herewith the annual report of this Society for the year 1884.

Trusting that our work as here indicated may meet with your approval and be commended to the Legislature as deserving of the confidence and support of the State government, I am,

Very respectfully, your obedient servant,

OLIVER GIBBS, Jr.,
Secretary.

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OFFICERS AND MEMBERS FOR 1884.

PRESIDENT.

TRUMAN M. SMITH	St. Paul

VICE-PRESIDENTS.

A. W. SIAS	Rochester
F. G. GOULD	Excelsior
A. H. REED	Glencoe
E. H. S. DART	Owatonna
G. W. FULLER	Litchfield

SECRETARY.

OLIVER GIBBS, Jr.	Lake City

TREASURER.

J. T. GRIMES	Minneapolis

EXECUTIVE COMMITTEE.

The President, Secretary and Treasurer *ex officio* and

J. M. UNDERWOOD	Lake City
W. E. BRIMHALL	St. Paul
J. S. HARRIS	La Crescent
R. J. MENDENHALL	Minneapolis
C. L. SMITH	Minneapolis

ENTOMOLOGIST.

R. J. MENDENHALL	Minneapolis

LIBRARIAN.

E. H. CUZNER	College of Agriculture, Minneapolis

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A. W. SIAS	Rochester
J. S. HARRIS	La Crescent
M. PEARCE	Minneapolis
ANDREW PETERSON	Waconia

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E. H. S. DARTT	Owatonna
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COL. D. A. ROBERTSON	St. Paul
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PROF. J. L. BUDD	Ames, Iowa
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KNIGHT WHIPPLE	Northome
WM. M‘INTOSH	Langdon

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WM. KING	St. Paul
MISS E. A. GILL	St. Paul

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SIDNEY CORP	Hammond
J. G. BASS	St. Paul
D. K. MICHENOR	Etna
M. CUTLER	Sumter
WM. CANNON	Fort A. Lincoln, D.T.
G. W. FULLER	Litchfield
WM. McHENRY	St. Charles
Olmstead County Horticultural Society	Rochester
W. K. BATES	Stockton
L. E. DAY	Farmington
A. J. PHILLIPS	West Salem, Wis.
O. M. LORD	Minnesota City
B. TAYLOR	Forestville
S. H. KINNEY	Morristown
W. E. BRIMHALL	St. Paul
CHAS. LUDLUFF	Carver
CLARENCE WEDGE	Albert Lea
W. A. SPRINGER	Fremont, Wis.
E. MEYER	St. Peter

SUPERINTENDENTS EXPERIMENTAL STATIONS.

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G. W. FULLER	Litchfield
A. W. SIAS	Rochester.
R. M. PROBSTFIELD	Moorhead
F. J. SCHREIBER	Moorhead
ANDREW PETERSON	Waconia
CHARLES LUDLUFF	Carver
UNDERWOOD & EMERY	Lake City
B. TAYLOR	Forestville
FRED VON BAUMBACH	Alexandria
E. H. S. DARTT	Owatonna
L. E. DAY	Farmington
J. H. BROWN	Lac qui Parle
J. S. HARRIS	La Crescent

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*The members of the General Fruit Committee are expected to report separately on all matters of interest in Horticulture, but more especially to bring to the notice of the society new and improved fruits.

ANNUAL MEMBERS, 1884.*

S. F. ALBERGER	Mankato
J. P. ANDREWS	Faribault
W. E. BIRMHALL	St. Paul
WALTER E. BIRMHALL	St. Paul
WM. HENRY BIRMHALL	St. Paul
HENRY F. BUSSEE	Minneapolis
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FRED BUSCH	Minneapolis
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J. G. BASS	St. Paul
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M. C. BUNNELL	Newport
ETHAN CRANDALL	Sumter
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E. H. CUZNER	Minneapolis
M. CUTLER	Sumter
S. CUTLER	Excelsior
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E. J. CLAUSSEN	Bismarck, D. T.
JOHN J. CASSIDY	Rochester
WM. CANNON	Fort Abraham Lincoln, D. T.
A. A. DIBBLE	Highmore, Hyde Co., D. T
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L. E. DAY	Farmington
E. W. DANIELS	Auroraville, Wis
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PHIL. EVERHARD	Mound Prairie
WM. FORSTER	Chatfield
MISS ANNA FORSTER	Chatfield
G. W. FULLER	Litchfield

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W. GOLDEN	Plainview
J. F. GILMORE	Richfield
ISAAC GILPATRICK	Minneapolis
F. G. GOULD	Excelsior
MRS F. G. GOULD	Excelsior
GEORGE T. GIBBS	St. Paul
MRS. R. M. GIBBS	Lake City
J. T. GRIMES	Minneapolis
OLIVER GIBBS, JR	Lake City
W. G. HENDRICKSON	St. Paul
JOSEPH HAMMOND	Hammond, Wabasha, Co
DWIGHT HOPKINS	Morristown
P. N. HALE	Minneapolis
PROF. C. W. HALL	Minneapolis
FRANK I. HARRIS	La Crescent
E. E. HARRIS	La Crescent
J. F. HOSMER	La Crosse
Z. K. JEWETT	Sparta, Wis
W. C. KILVINGTON	Minneapolis
SETH H. KINNEY	Morristown
J. C. KRAMER	La Crescent
CHARLES LUDLUFF	Carver
GEORGE LABBITT	Lake City
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WM. LYONS	Minneapolis
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DR. W. H. LEONARD	Minneapolis
O. M. LORD	Minnesota City
WM. McCRORY	Minneapolis
W. C. MESSMER	Lake City
L. D. MILLS	Garden City
W. McHENRY	St. Charles
D. K. MICHENOR	Etna
WM. McINTOSH	Langdon
R. J. MENDENHALL	Minneapolis
T. J. MEIGHEN	Forestville
E. NAGLE	Minneapolis
T. NELSON	St. Charles
J. NORQUIST	Red Wing
RICHARD PORTER	Huron, D. T.
ANDREW PETERSON	Waconia
JAMES W. POOL	Farmington

W. L. PARKER	Farmington
M. PEARCE	Minneapolis
EDWIN PICKETT	Carimonia
PROF. E. D. PORTER	Minneapolis
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A. SHERMAN	Canton, D. T
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BARNEY STEVENS	Farmington
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H. C. STEARNS	Minneapolis
CALEB SMITH	Farmington
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MRS. H. B. SARGEANT	Lake City
JOHN TEACHOUT	Farmington
JOHN TURNBULL	La Crescent
THOMAS E. TRUSSELL	Champlin
B. TAYLOR	Forestville
J. M. UNDERWOOD	Lake City
MRS. J. M. UNDERWOOD	Lake City
CLARENCE WEDGE	Albert Lea
K. H. WHIPPLE	Northome
C. W. WARD	Sumpter
HIRAM WEBSTER	Lake City
B. K. WATSON	Minneapolis
G. S. WOOLSEY	Minneapolis
M. C. WHITE	Minneapolis
J. M. WELLES	Minneapolis
JAMES WRIGHT	Minnesota City
PHILO WOODRUFF	Faribault

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*For names of members, 1883, who joined after Report of that year went to press, see appendix.

HONORARY MEMBERS FOR FIVE YEARS.

MISS HORTENSE SHARE, from 1880	Rosemount
MRS. L. E. P. SPRAGUE, from 1880	Minneapolis
MRS. ISAAC ATWATER, from 1880	Minneapolis
MRS. W. R. MURRAY, from 1881	Lake City
GEO. J. KELLOGG, from 1882	Janesville, Wis.
G. P. PUTNAM, from 1882	Ash Ridge, Wis.

HONORARY LIFE MEMBERS.

DR JOHN A. WARDER (deceased)	North Bend, Ohio
DR. P. A. JEWELL (deceased)	Lake City
LEONARD B. HODGES (deceased)	St. Paul
PROF. J. L. BUDD	Ames, Iowa
HON. MARSHALL P. WILDER	Boston, Mass.
GEO. P. PEFFER	Pewaukee, Wis.
E. WILCOX	La Crosse, Wis.
J. C. PLUMB	Milton, Wis.
J. M. SMITH	Green Bay, Wis.
MRS. C. O. VANCLEVE	Minneapolis
MRS. WM. PAIST	Hersey
WYMAN ELLIOT	Minneapolis
R. J. MENDENHALL	Minneapolis
TRUMAN M. SMITH	St. Paul
L. M. FORD	St. Paul
M. PIERCE	Minneapolis
COL. J. H. STEVENS	Minneapolis
CHARLES HOAG	Minneapolis
J. T. GRIMES	Minneapolis
CHARLES Y. LACY	Fort Benton, M. T.
F. K. PHENIX	Delavan, Wis.
PETER M. GIDEON	Excelsior
MRS. WEALTHY GIDEON	Excelsior
MRS. JAMES BOWEN	Minneapolis
HON. NORMAN J. COLEMAN	St. Louis, Mo.
R. S. COTTRELL	Dover Center
A. W. SIAS	Rochester
MRS. IDA E. TILSON	West Salem, Wis.
MRS. H. B. SARGEANT	Lake City
MISS SARA MANNING	Lake City
D. W. HUMPHRY	Fariabault

HONORARY MEMBERS FOR 1884.

WILLIAM A. SPRINGER	Fremont, Wis.
S. BARTER	Markesan, Wis.
DR. T. H. HOSKINS	Newport, Vermont
HON. H. G. JOLY	Quebec, Canada
DR. F. G. HOUGH	Lowville, N. Y
J. E. WARD, St. Paul Globe	Minneapolis
C. A. COOK, St. Paul Pioneer Press	Minneapolis
MISS C. J. BARTLETT, Daily Tribune	Minneapolis
L. B. LITTLE, Daily Tribune,	Minneapolis
W. VAN NORMAN, Evening Journal	Minneapolis

MINNESOTA STATE HORTICULTURAL SOCIETY

SUMMER MEETING, 1884.

PROGRAM.

FIRST DAY, WEDNESDAY, JUNE 27.

ENTRIES FROM 9. A. M. TO 2 P. M.

2 p. m —Opening exercises, Addresses, Volunteer papers, Question Box and Discussions.

Appointment of judges on premiums.

SECOND DAY, THURSDAY, JUNE 28.

The exhibition will open at 9 a. m., and judges will please hand their awards to the Secretary at 12 m.

The meeting will be informal and social, and at 12 m. the exhibitors, members and invited guests will confiscate the entire display of fruits for the purposes of a basket picnic dinner.

2 p. m.—Announcement and payment of premiums.

Addresses, Question Box, Volunteer papers and discussions, general business and final adjournment

The Annual Report for 1884 will be ready for distribution at the meeting.

J. S. HARRIS,
President.

OLIVER GIBBS, Jr.,
Secretary.

PREMIUM LIST.

PROF. EDWARD D. PORTER, Superintendent of Exhibits.

STRAWBERRIES.

Best display, not less than six varieties. 1st premium, $5; 2d, $4; 3d, $3 4th, $2.

Best variety for general market, $3.

Best variety for home use, perfect in flower, $3.

Best three plants in bearing, grown in pots, $3; 2d, $2.

	1st Prem.	2d Prem.
Best quart Wilson's Albany	$1.00	.50
Best quart Charles Downing	1.00	.50
Best quart Downer's Prolific	1.00	.50
Best quart Green's Prolific	1.00	.50
Best quart Crescent Seedling	1.00	.50
Best quart Captain Jack	1.00	.50
Best quart Cumberland Triumph	1.00	.50
Best quart Miner's Great Prolific	1.00	.50
Best quart Red Jacket	1.00	.50
Best quart Pioneer	1.00	.50
Best quart Glendale	1.00	.50
Best quart Endicott No. 2	1.00	.50
Best quart Downer	1.00	.50
Best quart Sharpless	1.00	.50
Best quart Manchester	1.00	.50
Best quart Bidwell	1.00	.50
Best quart Minnetonka Chief	1.00	.50
Best quart Iowa Prolific	1.00	.50
Best quart Hart's Minnesota Seedling	1.00	.50
Best quart Kentucky	1.00	.50
Best quart Windsor Chief	1.00	.50
Best quart Boyden	1.00	.50
Best quart variety not herein named	1.00	.50

SPECIAL PREMIUM.

Offered by Wyman Elliot, Minneapolis.

Best Seedling Strawberry, not before exhibited, $6; 2d, $4.

CHERRIES.

Best quart Early Richmond	$2.00	$1.00
Best quart any other variety	2.00	1.00

Strawberries and Cherries will be displayed on tea plates to be furnished by the Society.

PLANTS AND FLOWERS.

	1st Prem.	2d Prem.
Best display of greenhouse plants	$10.00	$5.00
Best display of roses in pots	2.00	1.00
Best display of fuchsias	2.00	1.00
Best display of geraniums	2.00	1.00
Best floral design in cut flowers	2.00	1.00
Best basket cut flowers	2.00	1.00
Best hand bouquet cut flowers	2.00	1.00
Best bouquet of roses	2.00	1.00

VEGETABLES.

Best display	$5.00	$3.00
Best half peck green peas	1.00	.50
Best half peck string beans	1.00	.50
Best six bunches of onions	1.00	.50
Best six bunches of beets	1.00	.50
Best six bunches of radishes	1.00	.50
Best six bunches carrots	1.00	.50
Best six bunches turnips	1.00	.50
Best six bunches asparagus	1.00	.50
Best three heads cabbage	1.00	.50
Best three heads cauliflowers	1.00	.50
Best three heads lettuce	1.00	.50
Best six stalks pie plant	1.00	.50

The exhibition is open in all departments to growers in Minnesota, Wisconsin, Dakota and Northern Iowa,

M. PEARCE,
WYMAN ELLIOT,
J. T. GRIMES,
Committee of Arrangements
Minneapolis, Minn.

The society met at the College of Agriculture, University of Minnesota, at Minneapolis, Wednesday. June 27th, 1883, and was called to order at four o'clock in the afternoon by President Harris, who read the following address:

PRESIDENT'S ADDRESS.

Members and Friends of the Minnesota State Horticultural Society :

We meet again in these familiar halls for a season of rest and recreation, and to make another page in the book of horticulture; to exchange friendly greetings, and to tell one another of our successes and failures, and to receive and impart information that shall make us happier in the pursuit of our avocation, and more useful citizens of Minnesota. The queen of fruits, the gay beautiful queen, has spread a feast and decked the tables with garlands, and we are the invited guests. We come from near and far, and have left business and care at home, and she bids us have a good time. As she is the first dowered daughter of Pomona, it is well that we are disposed to win her smiles by devoting to her much of our attention. Sweet Flora has also secured a place of honor in this feast, and although she may blush to hear our open praise of her beauty, she will not withdraw her smiles or withhold her sweetness when we do homage to the queen. We meet under auspicious circumstances, and we have reasons for congratulation upon the progress that horticulture is making in this state, and for rejoicing that a benificent Providence has smiled upon all our broad domain and given us a seed time, and a bountiful harvest is now at our very doors. The floods and the winds that strike terror to the heart and leave ruin and death in their track have passed us by and health and prosperity are our lot. Our Society is in a flourishing condition; is entirely out of debt, except a debt of gratitude to those true friends who had faith in us, and rendered us assistance in our day of small things, and we have a larger membership than at any previous time. I have heard only good reports of the late annual meeting held in this place, and it has universally been pronounced the best one yet held, and has resulted in a volume of transactions that, I believe, will when placed in the hands of our farmers and horticulturists soon add many times its cost to their wealth and prosperity. It was a meeting that I had looked forward to with much pleasure, but was prevented in attending by a summons to the bedside of my aged mother who died soon after. The last winter was one of unusual severity, but not so disastrous to our fruits as we had feared, and no doubt we may attribute the survival of many of our trees and plants to the depth of snow that covered the ground. As it is, it has been a test winter, and is a reminder that our pomology is in need of further development.

At the annual meeting it was voted to establish a number of experimental stations where the new seedlings or any varieties seeking public favor, shall be put upon a test trial in a systematic way to bring out their merits, and to be reported upon to the society at its annual meetings. In accordance with this the executive committee have held a meeting and designated the following places and persons for the purpose, viz :

Station No. 1, Minneapolis, E. D. Porter and M. Pearce; No. 2, Lake City, Underwood and Emery: No. 3, La Crescent, J. S. Harris; No. 4, Rochester, A. W. Sias; No. 5, Faribault, O. F. Brand; No. 6, Fergus Falls, Jacob Austin; No. 7, Moorehead, R. M. Probstfield. I presume that every gentleman at the head of these stations has facilities for giving the proper tests to all varieties that may be sent to them, and will enter promptly upon the work whenever buds and scions are furnished them. This system if fully carried out, will subject the candidates to a very thorough test, and quickly demonstrate which are not adapted to the more unfavored localities, and do away with much of the uncertainty that always follows the introduction of a new variety, and in a great measure protect our members from the swindling so frequently practiced by foreign tree venders, as the fruit will be pretty well known and also the parties having it in stock, through the reports made by the managers of these stations. But I would not have you understand that these stations are to take the place of or do away with individual effort in the same direction. They are designed to hasten and facilitate the work. If every farmer, nurseryman and gardener in the state were to immediately set about the work of originating a good, long keeping variety, perfectly adapted to every part of the country, and if one or a dozen of them should succeed, if done outside of this organization, it could hardly be hoped that less than 10 years would elapse before it became known and tested and another ten before it had been propagated, placed in the hands of the people and yield fruits in paying quantities, that will meet all demands. Therefore it is important that the experiment be started without delay, and pushed forward by every appliance that can be afforded by science and organization, or before the good time comes, this generation will have passed away, and their children's children will have their teeth "set on edge" by the sour crab. It is expedient also to make the most of the varieties that are already originated by looking them up as speedily as possible, and give this generation a tree before they are gathered to their fathers. I am glad to note that the interest in the growing of seedling fruits is on the increase, and some of the reports received are encouraging. There is one other matter to which I wish to call your attention at this time, the 19th session of the American Pomological Society is to be held in the city of Philadelphia, commencing Wednesday, the 12th day of September, next.

All Horticultural, Pomological, Agricultural, and other kindred associations in the United States and British Provinces, are invited to send delegations, and all persons interested in the cultivation of fruits are invited to be present and take seats in the convention. Nearly every State in the Union will be represented in the meeting, and most of them will doubtless make creditable displays of their fruits. With this end in view we made an effort last winter to secure from our legislature an appropriation of $500, to defray the expense of two delegates and a display of fruits, but failed to secure it. Many thousands of dollars of money was appropriated to purposes that, in the end, may prove of less importance than this, yet I do not feel that we should censure our Hon. Legislature, but rather blame ourselves for not moving sooner and educating our worthy members up to the standard of the age. While it would be a rare treat for any of our members to meet with so many distinguished horticulturists, there are but few of them in such financial circumstances that they can afford the time or expense of going so great a distance. Please to give the matter your consideration, and if you deem it advisable and we cannot send delegates, make sure arrangements for a small exhibit of our choicest fruit. If you deem it expedient to do so, it will become necessary to create a committee to make and forward the collection of fruit and also to provide for the expense of shipping the same. I am of the opinion that under the act of the Legislature passed February 27th last and duly signed by the Governor, re-organizing the State Agricultural Society, and appropriating moneys to aid county and certain other societies, we are entitled to an additional sum of $100, or more, as soon as we comply with the provisions of the act. We are holding annual fairs in connection with our summer meetings and paying premiums in excess of the amount required by law, and that too, upon articles that cannot be exhibited at the season when the state fairs are held. I would recommend the appointment of a committee to investigate the matter, and if such moneys are due us we could devote a like sum to the offering of special premiums at the state or other fairs where our society has the privilege of competing for premiums.

The sad duty devolves upon me of announcing the decease of two active and esteemed members of our society.

The Hon. Leonard Bacon Hodges, the great Arboriculturist of Minnesota, and late Secretary of the State Forestry Association, and James Bowen, our late librarian, are dead. Mr. Hodges died at his residence, 408 Laurel avenue, St. Paul, about 8 o'clock p. m., Saturday, April 14th from a complication of diseases having their origin in an enfeebled condition of the digestive organs. He was born at West Bloomfield, Ontario county, N. Y., on the 15th day of July, 1823. His ancestors came from England early in the history of the colonies, and were distinguished for their patriotism and unselfish devotion to the institutions of this country. In the biographical sketch of this useful man which appeared in the Pioneer Press of April 16th, we find that he left his home and set out to face the world at the age of thirteen years. He first found employment at New Haven, Conn., as a clerk in a book store. Afterwards he entered the English department of the Seminary at Andover, Mass., for the purpose of perfecting his knowledge of the science of surveying and adding to his stock of general knowledge, and after leaving the Seminary he spent three or four years at surveying, teaching and farming in the state of New York. He came to Rockford, Ill., in 1845 and purchased a farm, but did not remain there long. From there he went to Wisconsin, and after engaging in various pursuits he proceeded to Alamakee county, Iowa, and was United States deputy surveyor, did considerable work in that state and the adjoining Northwest, and thus became familiar with the aspect and wants of this counrry and fitted to enter with zeal upon a course that would hasten its development. In 1854 he came into this state and began work upon a farm and was the founder of the town of Oronoco, and in 1870 he was nominated and elected to a seat in the senate of our legislature, upon an antimonopoly platform. He settled in St. Paul in 1872, where he continued to reside up to the time of his death. He became a member of the State Horticultural Society at the annual meeting, Jan. 20, 1875, and at that meeting contributed an able paper on forest culture on the St. P. & P. R. R. and a portion of the country tributary thereto. He has since continued a member of the society and contributed several able and instructive papers, the last of which is contained in the volume of transactions just published. He was founder of the State Forestry Association which was organized in 1876, and its master spirit and Secretary up to Jan. last. He also prepared the original draft of the timber culture act, which is proving of such great benefit to the settlers upon our prairies, and was also author of "The Manual of Tree Planting." As a writer, he was practical; as a speaker, fearless, positive and convincing. He more than any other man of this or past generations has opened the way for dotting our prairies with groves and forests, and also opened the way for practical and safe fruit culture by his perseverance in advocating the work and the successful conducting of experiments whereby he changed public opinion and proved that "trees if properly planted can be made to grow where nature has failed to provide them," and in so doing has built his own monument in the heart of every member of this Society, and his name will yet be canonized on ten thousand hearth stones in this State, and we can point with sincere pride to his earnest and useful life, and the courage that never failed him as an inspiring example to ourselves and to those who are to come after us.

I recommend the adoption of the following resolutions as a tribute to his memory:

In Memoriam.

LEONARD B. HODGES.

1st. *Resolved*, That in the death of Leonard Bacon Hodges, Minnesota has lost her foremost leader and pioneer in forestry, and this society one of its most able, earnest and intelligent members.

Resolved, That we contemplate with admiration his successful career in this state as an advocate and planter of forest trees along the lines of railroads and upon our treeless prairies, and his perseverance in advocating the work and conducting experiments whereby he has changed public opinion, and proved that our most bleak prairies can be so ameliorated as to become a pleasant and desirable abode for man, and that with sincere pride we point to his earnest and unselfish life and the courage that never failed him as an inspiring example to ourselves and to those who are to come after us.

My acquaintance with Mr. Hodges was slight, but slight as it was I had learned to esteem him very highly and hope that another pen may put upon record a fitting memoriam.

The following judges were appointed to award the premiums:

On Fruits.—Wyman Elliot, J. T. Grimes, Peter M. Gideon.

On Plants and Flowers.—Mrs. L. E. P. Sprague, Mrs. J. M. Welles, Mrs. Wealthy Gideon.

On Vegetables.—Col. John H. Stevens, Ditus Day and A. J. Phillips.

Col. Stevens called attention to the approaching meeting of the American Forestry Congress, at St. Paul, and suggested that some action be taken regarding it; and on motion, he was requested to draft and present a suitable resolution for adoption, extending a hearty welcome to the congress.

The day being too far advanced to take up the regular business, the remainder of the session was devoted to discussion on the potato, suggested by the following from the

QUESTION BOX.

Which are the two earliest varieties of potatoes best suited to Minnesota?

Wyman Elliot. The two best varieties in general cultivation are Beauty of Hebron and Early Ohio. What two are really the best is perhaps a matter of experiment with the newer kinds.

President Harris. The best single early sort is the Beauty of Hebron.

Mr. Elliot. The Early Ohio requires sandy soil. In clay or any heavy soil it is not so good. Clark's No. 1 is an A No. 1 potato. It is not nearly so early as the Hebron. It is an immense yielder on sandy clay loam.

The Secretary. I planted the Gideon Seedling and the Beauty of Hebron the same day last year, and the Gideon gave me the market for nine days, at Lake city, before any other potato got in. The objection to it is that it closely resembles the Early Rose and scabs badly; although the Early Ohio on my grounds takes the blight and the scab the worst of anything.

A vote being taken, the experience of the majority present was declared in favor of the Beauty of Hebron and the Early Ohio.

SECOND DAY.

A. J. Phillips, of West Salem, and E. G. Partridge, of Warren, St. Croix county, presented credentials as delegates from the State Horticultural Society of Wisconsin, and were welcomed accordingly.

STRAWBERRIES AND THEIR CULTURE.

Mr. Pearce. For the purpose of opening the discussion on this subject I will ask what is the proper time of setting strawberry plants?

Peter M. Gideon. In the spring, as soon as the frost is out of the ground and the soil in proper condition to work. If the plants are vigorous and well set they will bear a crop the same season.

Mr. Pearce. I set last year the first of June. Removed all the buds and blossoms. Used a paddle, and set the roots straight down, never had plants grow better. This year, I set the tenth of June two and one half acres, and never lost a plant. There is more vigor then in the plants to start the new growth that is necessary immediately after the setting.

Mr. Gideon. I use a dibble or spade, and spread the roots in fan shape.

Mr. Elliot. The best time is just after the plants have made new leaves. Always pinch off the buds and runners before planting. Never set from old spent beds, as the plants will be neither pure nor vigorous. Dig with a fork and save all the roots possible. Never put any earth on the crown in setting. Be careful to have the ground well packed or firmed around the plants when set. Neglect of this is the cause of the most of the failures, as then the loose surface lets in the dry air upon the fibrous roots and kills them before they begin to absorb moisture for themselves. Cultivate deep and thoroughly the first year.

Prof. Edward D. Porter. The main thing is to have the right conditions of the soil, the plant, and the weather. Then I would risk planting in any month when the plants were growing. According to our experience here I would say the best time to plant is usually the last week in May or the first in June. Mr. Elliot states the most important point when he advises careful firming of the soil around the plant. In eastern fields the men are instructed to set the foot on each plant. The pressure of the hollow of the foot on the crown of the plant does the firming.

President Harris. I agree with Professor Porter, but think the last of May is generally preferable. I make a practice always to firm by putting my foot on the plant, and sometimes wish I weighed more. It is difficult to make hired men do this properly, as they are afraid of hurting the plants. The ground must be in high tilth, and every way in good order to grow strawberries to advantage. I believe the old style of leaving all the roots on is best. Fall setting does fairly well with me. Say in October. August is unfavorable on account of drouth.

Fred Busch. I have a number of kinds, but the Wilson takes the lead as yet. Crescents bear well, but the second year of Wilsons is equally as good as the first. My soil is the common loam with clay subsoil. Late set Wilsons do not bear well. The Crescent being pistillate must be fertilized by staminate sorts or it will not bear. The Countess [Downer's Prolific], bears about as much fruit as any of them on sandy soils, but does not do so well with me. I think the Glendale is a nice berry. It is late. These with Wilsons and Crescents are best on my soil.

Prof. Porter. The Crescents and Wilsons are the favorite market sorts East.

Mr. Gideon. Of all that we have tried we prefer the Green Prolific and Crescent. For a fertilizer we use the Downer's Prolific or Charles Downing. These mix well.

Mr. Pearce. For all soils I think nothing gives such general satisfaction as the Crescents, for home use. For a fertilizer I use the Glendale. For a farmer's berry I would recommend the Pioneer.

Mr. Partridge. I have used the Wilson and Kentucky to fertilize the Crescent. The Wilson for early pollen. the Kentucky for the later blossoms.

The Secretary. Mr. Partridge here brings up an important point that should be fixed in our minds; the necessity of extending the pollen to the latest blossoms as well as giving it to the earlier ones of the pistillates. Inattention to this is probably the cause of so many small inferior berries from the late blossoms in many cases. The idea of having two staminate kinds to do it, an early and a late one, is new and valuable.

F. G. Gould. The best berry for the farmer is the best one for everybody else. The question of profit is the main question. So far as my knowledge goes, I see but little difference in quality of different sorts. Have been growing strawberries ten to fifteen years. I got the Wilson, first, and on the whole they do the best on my grounds. They fertilise themselves. The yield is great, and the berries are large, and can be shipped to distant points, and come out sound. I think it wrong to place Crescents ahead of Wilsons. The first crop of Crescents may be heavier, but after that inferior.

Mr. Elliot. The Wilson is a shy grower, unless it has good cultivation the first part of the season. The Crescent and Downers or Countess are rank growers and get ready for a full crop the first year. If growers on sandy soils will manure and cultivate well they will have no trouble to make it bear a good crop.

In reply to a question from Col. Stevens : I wish to correct my record as to the identity of the Countess and the Downer's prolific. I think they are the same.

Mr. Gideon. For the farmer we want the best flavored berry that is productive, and for this reason I hold that the Wilson is not the one. It is profitable for the grower for market, the gardener; but the Green Prolific is of a more delicious flavor and productive if well fertilized.

W. J. Abernethy. I have fifteen varieties. My soil is clay with some sand and fertile. I covered my Wilson's last fall with manure. This spring raked it off, and now have as heavy a crop as I ever saw anywhere of any variety. Crescents treated the same way, and now bearing heavily, this being the third year. Charles Downing appears not to be a free bearer. Perhaps it requires more age. Duchess and Sharpless entire failures. Hart's Seedling not successful. Some large berries, but stems short and fruit down in the ground. Kentucky does well. The best for flavor is the Cumberland Triumph though not a great bearer. Champion late and nice. Jersey Queen is late. I am suprised prised to see how few varieties have good blossoms for fertilizing. Wilson is the best of all in this respect. Am much pleased with the Bidwells so far. Mine are full, and the berries very large. Glendales show a blight or burning of the leaves.

Mr. Busch. Is the Jersey Queen a good bearer?

Mr. Abernethy. With me it bears quite well.

The President. Is the Cumberland Triumph perfect in flower?

Mr. Abernethy. Very fair in this respect.

Mr. Phillips. I have berries here of the Bidwell variety grown by John Van Loon, of New Amsterdam, Wisconsin, picked two days ago, June 25. They were exhibited at our La Crosse meeting that day, stood at the Minneapolis depot all day yesterday, and are still in good condition. Mr. Van Loon says he never had any vines on his grounds, so heavily loaded with berries as these Bidwells are.

The President. In years past, I have said a good deal against the Green Prolific. One reason was I did not know it needed a fertilizer. It was a wise thing done when this society enlisted such a man as George P. Peffer, of Wisconsin, to instruct us in regard to blossoms of fruit, plants and trees, and now I am satisfied that the Green Prolific is a good variety if well-fertilized by staminates grown near by. The Wilson is good in flavor, if well ripened. We must not give up experiments, but let us stand by the well tried sorts.

Mr. Gould. I have noticed that a well-established Wilson sends up from two to four well-loaded stems of fruit, while Crescents are apt to have only one stem and many small berries. There is a new candidate in the field—the James Vick. It seems to give better promise than any new variety I have seen. I have not fruited it yet, but from its appearance as a plant and from what I have read and heard of it, I prophecy this variety has come to stay.

Mr. Gideon. A rich black loam will not produce as many Wilsons as a clay soil. The Crescent will beat the Wilson on the loam two to one.

Mr. Fawcett. There is an adaptation of varieties to particular soils to be considered, and no rules can be laid down as to the best varieties without careful reference to this fact. Many varieties are very particular in regard to their soils, and others seem to do well on all soils.

Mr. Busch. Many persons think they have the Wilson when the plants are something else.

Mr. Gideon. Old patches always have more or less seedlings. My Crescents when I got them were pure, but I noticed last year I couldn't go two feet without finding seedlings. In the course of time these seedlings get full possession, and being sent out for new plantings are called Crescents; and it is so with the Wilsons.

George S. Woolsey. I raised Wilsons for ten or fifteen years, and they nearly all ran out.

On a ballot for choice of varieties they were arranged in the following order:

1st. Wilson.
2d. Crescent.
3d. Downer's Prolific.
4th. Charles Downing.
5th. Green Prolific.
6th. Captain Jack.
7th. Pioneer.
8th. Hart's Seedling.

In Memoriam.

JAMES BOWEN.

Resolutions of respect to the memory of James Bowen having been introduced by A. J. Phillips and W. J. Abernethy, were, on motion, incorporated as one as follows, and adopted as the sense of the society, and the secretary instructed to transmit a copy to Mrs. Bowen:

Whereas, James Bowen, librarian of this society, and instructor in Horticulture at the State University, has gone from our midst since our last meeting, into the great change which we are accustomed to call death, therefore

Resolved, That we here express our sincere appreciation of his worth when we say that in his loss we give up a useful and valued member of the State Horticultural Society, and that in his long experience in his chosen field, of horticulture and floriculture, and his ability to impart instruction to others, united with his kindness and consideration for the wants of all with whom he came in contact, he was eminently fitted for the responsible station which he occupied.

Resolved, That this society extend its sympathy to the wife and children of the deceased, and that as a mark of respect to them and to his memory it order these resolutions placed on the records of the society, and printed in its annual report.

On motion the secretary was instructed to draw an order in favor of Mrs. Bowen, for ten dollars, for her late husband's services as librarian.

Mr. Phillips. Before this passes out of the order of business, I desire to say that there are circumstances connected with the death of our friend Bowen, that in a peculiar manner are calculated to enlist our sympathies with him and his wife and dependent family. Misfortune has fallen heavily upon them. Since our last meeting two of their children were horribly frightened by a tramp — one of them so as to cause its death — the other so as to lose for life its sense of hearing. They have also buried two other of their children, twins, within the same period, and now the husband and father has been snatched away. James Bowen was a man who had in a brief time since the society has met here at the College of Agriculture, endeared himself to all our hearts. None of us will forget how laboriously, yet cheerfully, he worked at our last winter meeting to make our sessions here pleasant and profitable. While we hold him in greatful remembrance let us not forget to aid to any extent in our power the widow and the fatherless whom he has left for our care.

On motion Mrs. Bowen was declared an honorary life member of this society, and the secretary instructed to notify her of the same.

AMERICAN POMOLOGICAL SOCIETY.

Prof. Porter. At the winter meeting last January, the society did me the honor to recommend to the executive committee my appointment as delegate to the meeting of the American Pomological Society to be held at Philadelphia, September 12th. It is expected, as I understand the matter, that an exhibition of the fruits of our state is to be made there; and I wish to say to the society that while I can and will gladly if required attend to the transportation and display of the fruits, it will be necessary to confide the collection of them to other hands, as my time and duties will not make it possible for me to attend to that.

Col. Stevens moved that the president and secretary be authorized to get the fruits together and pack them for transportation; and they declining, Wyman Elliot, Mr. Lowell and M. C. Bunnel were suggested, and after various motions and remarks on the subject the whole matter was laid over for the action of the executive committee.

INVITATION TO DINNER NEXT YEAR.

Prof. Porter. As the society is aware we are fitting up the new University farm out on the Como road, a three miles ride from here. A year from now our buildings will be completed and the grounds cleared and put partially in order to receive company, and as the College of Agriculture, to say nothing of the University itself, has a warm side for the State Horticultural Society, I desire to invite you all to come out and dine with me on the occasion of your assembling for your summer meeting in the year 1884.

On motion the invitation of Prof. Porter was accepted, with the understanding that the usual ceremony of confiscating the strawberries on exhibition to the common use of members and guests may be done at the farm.

Recess till 2 p. m.

AFTERNOON SESSION.

The judges having returned their awards, the list of entries and premiums was read, as follows :

STRAWBERRIES.

Wilson. Oliver Gibbs, Jr., first premium on single quart, on best variety for home use and on best variety for general market. W. E. Brimhall, second premium on single quart. Other entries were by John F. Gilmore, Underwood & Emery, Henry F. Bussee and J. S. Harris.

Charles Downing. J. S. Harris, first premium.

Downer's Prolific. Underwood & Emery, first premium.

Crescent. Henry F. Bussee, first premium ; William Lyon, second premium. Other entries by Oliver Gibbs, Jr. and M. Pearce.

Captain Jack. W. E. Brimhall, first premium.

Pioneer. M. Pearce, first premium ; John F. Gilmore, second premium.

Glendale. George W. Woolsey, first premium ; J. C. Kramer, second premium. Other entry by William Lyon.

Countess. William Lyon, first premium.

Sharpless. Underwood & Emery, first premium.

Bidwell. John Van Loon, first premium.

Minnetonka Chief. George W. Woolsey, first premium.

Harts' Minnesota Seedling. W. E. Brimhall, first premium.

Windsor Chief. William Lyon, first premium.

Boyden. Underwood & Emery, first premium.

Duncan. William Lyon, first premium ; M. Pearce, second premium. Other entry by John F. Gilmore.

New seedling strawberry never before exhibited. N. Hintgen, first premium ; J. C. Kramer, second premium.

PLANTS AND FLOWERS.

Floral Design. Underwood & Emery, first premium.

Basket Cut Flowers. Underwood & Emery, first premium.

Hand Bouquet. Underwood & Emery, first premium.

Display of Pansies. George W. Woolsey, first premium ; Underwood & Emery, second premium.

Basket Cut Flowers. Mrs. W. G. Hendrickson, first premium.

VEGETABLES.

Asparagus. J. T. Grimes, first premium ; J. C. Kramer, second premium. Other entries by W. E. Brimhall and Frank Abernethy.

Lettuce. J. S. Gray, first premium; W. E. Brimhall, second premium.

Pie Plant. Frank Abernethy, first premium ; J. S. Harris, second premium.

Cauliflower. Fred Busch, first premium.

The premiums were then certified to the treasurer and paid.

GENERAL BUSINESS.

HONORS TO MRS. GIDEON.

The Secretary. Mr. President and fellow members: The readers of our reports have found scattered along our pages frequent mention of a seedling apple called the Wealthy. It has been and will be in the future, very prominent in the history of fruit in the United States. Last winter we elected its originator, Mr. Peter M. Gideon, an honorary life member of this society, and as we now have with us the "original Wealthy," so far as the name of the apple is concerned, Mrs. Wealthy Gideon, I move that this lady be also declared an honorary life member of our society.

The motion being seconded was submitted to a vote and carried unanimously.

Mr. Gideon. On behalf of Mrs. Gideon and at her request, I return you our hearty thanks for the honor you have conferred.

AMERICAN FORESTRY CONGRESS.

Col. Stevens reported the following resolution :

Resolved by the Minnesota State Horticultural Society, in convention assembled :

That the Society is grateful to the American Forestry Congress for the compliment of the selection of the City of St. Paul, the capital of our State, for holding their annual meeting for the year 1883, and that the members of the Society are requested to forward the interest in every possible manner of the said congress during their deliberations, and extend a welcome hand to each and every member of that distinguished body.

Resolved, That this Society would most respectfully urge upon our agriculturists and horticulturists, the importance of attending the session of the American Forestry Congress at St. Paul, being fully convinced that there is no one matter fraught with more moment to the present and future generations of our northwest than the agitation of forest culture.

The resolution was adopted.

APPROPRIATIONS AND BILLS ALLOWED.

On motion there was appropriated to the Secretary $75 for postage in sending out reports and $25 for office expenses, to be accounted for at the annual meeting; also to President Harris, $7 for expenses, and the following bills were ordered paid:

Johnson, Smith & Harrison, $2 for letter heads for use of the President.

H. B. McKenny, $13.50, printing programs and letter heads for the Secretary.

LIBRARIAN.]

E. H. Cuzner was announced as Librarian for the Society in place of James Bowen, deceased.

QUESTION BOX.

What is the cause of apples falling from the trees soon after setting?

Prof. Porter. Deficient vitality in the tree, from various causes, unfavorable seasons, storms, etc., the tree setting more fruit than the branches or buds can nourish.

Mr. Gideon. Fruit often fails from hard beating rains while in the bloom.

Prof. Porter. The germ is formed the preceding year, but the fertilization which produces development occurs after the blossoms are opened in the spring, and storms may then blight or impair the vigor of the pollen.

What is the prospect for the fruit crop the present year in Minnesota?

Mr. Gideon. Apples injured in blossoms by driving rain. Small fruits never better.

President Harris. Strawberries a fair crop, but season will be short. Apples in the river district where I live only a fair crop. At Rochester the prospect seems to be good for all fruits.

Prof. Porter. I would like to ask Mr. Phillips how the Whitney No. 20 stood the winter?

Mr. Phillips. All sound to the terminal bud, except some that were broken down by snow drifts. If a man cannot grow the Duchess and the Whitney No. 20, I would not advise him to set anything. Trees that last year bore a heavy crop of winter apples, went into the winter in an exhausted condition, and showed signs of weakness early this spring, but will mostly recover. Duchess and others that matured their fruit early, went in strong and have come out strong.

SECKEL PEAR.

The Secretary. I am interested in a small experiment with Seckel Pear grafted on Whitney No. 20 and Beecher Sweet, as this is said in Western New York to be the only pear that is a permanent success on the apple. My cions were grafted last spring. They took vigorously and are growing well. I will report them hereafter.

STATE ORCHARD.

Mr. Gideon, in reply to a question by Prof. Porter. The trees in the State Orchard were not permanently injured by the hail storm last spring.

WHITNEY NO. 20.

Mr. Phillips. I will repeat what I have before recommended about the Whitney No. 20. Set them out along roadsides and farm lines for posts to use in wire fencing, and for ornament and fruit. They are as straight and regular as any fence post, and you can trim them high.

Mr. Pearce. I grafted Whitney five years ago. Have some 600 in orchard. A great many people come to me for ornamental trees, and I give them the Whitney. Its form is upright, regular, and they all have an expression of their own as distinct from any other tree as the Lombardly Poplar. I have never seen any blight on them.

Mr. Phillips. I have seen the old original Whitney No. 20, at A. R. Whitney's Franklin Grove, Illinois, when it had six bushels of apples on it.

M. C. Bunnell. Out of a bill of 125 trees I sold last year in Dakota county, 75 per cent. were badly discolored this spring; but a lot of Whitneys among them looked best of all.

PROTECTION.

Prof. Porter. I saw an orchard last spring, of 16 years growth, protected by belts of evergreens set in alternating rows, and the owner said the effect was disastrous from unequal temperature. This man would now select the bleakest site on the farm for his orchard.

President Harris called attention to the approaching fall fairs, state, district and county, and urged upon members of the society the importance of attending and giving them all the aid in their power in the exhibition of horticultural products.

Discussions of other interesting topics occupied further time during the afternoon, but were not preserved for the report owing to the absence of a reporter, the secretary being engaged in closing up the business of the session, relating to premiums, and distribution of books to members.

The meeting was a pleasant one, and on the second day largely attended, but not as successful in the fruit exhibits as formerly, owing to the anomalous character of the season, and the difficulty of fixing upon the date in advance to hit the ripening of the strawberries, in difierent parts of the state, to the best advantage.

PREMIUMS AWARDED AND PAID.

On Strawberries	$23.00	
On Plants and Flowers	10.00	
On Vegetables	5.50	
		$38.50

MEETING OF THE EXECUTIVE COMMITTEE.

The Executive Committee met at the Senate Chamber, State Capitol, St. Paul, at eleven o'clock, a. m., August 8th, 1883, upon the call of the chairman.

Present, J. M. Underwood, chairman ; and Messrs. Gould, Grimes, Brimhall, Brand, and the Secretary, President Harris being absent from the state.

The Chairman. I have called the committee together to decide what action is best to be taken in regard to sending a collection of our fruits to the meeting of the American Pomological Society, to be held at Philadelphia, September 12th. It was the understanding last winter that Prof. Porter would serve as our delegate, but he cannot attend to the collection and shipping of the fruit ; and although various suggestions were made to cover this point at the summer meeting in June, nothing decisive was hit upon, and it is not known that any one feels specially charged with this duty or is authorized to incur the necessary expense. The committee at their meeting in St. Paul, in February, made an estimate of $400 as the outside figure of all expenses connected with the sending of a delegate, the collection and exhibition of fruit, &c. The question is now, what action shall we take in the premises, as it appears to rest entirely with this committee.

Mr. Grimes. It appears to me the first question in order is, have we got such a crop of fruit as will enable us to make a creditable exhibition? I am not well posted as to the facts elsewhere, but in the neighborhood of Minneapolis, at Excelsior, and elsewhere in this vicinity the apple crop is nearly a failure, and we could not be depended upon to contribute much to the display.

Mr. Brimhall. The apple crop is also poor about St. Paul.

Mr. Brand. And in our part of the State it is hardly up to the average.

The Chairman. I can only speak of our own orchard at Lake City. There we have for some reason a very full and promising crop. Our Secretary is usually well posted in these matters. If there is any fruit anywhere he generally knows where to find it. I think we had better hear from him.

The Secretary. Taking a general view of the apple crop in the State, it is a failure here, as in almost all the States this year, owing to unfavorable conditions since the spring opened, yet there are exceptions. In certain belts and spots as fine apples can be found this year as ever. We can supply from Lake City and vicinity all the sorts usually seen at our fairs, and in good condition; and by a careful search about this and other portions of the State, I am satisfied we can make a fairly representative collection. But this will take time and money, expert judgment and handling and great care. The growing season will be late. This will enable us to put in the Duchess in firm shape to head the show alongside of the Wealthy. As to grapes, there is a fair prospect to get them ripe enough in some of our warmest vineyards to show the fine bloom and quality of which Minnesota grapes are capable. It would be a misfortune to be obliged to go to Philadelphia without our grapes. I would like to hear from Mr. Gould as to the prospect of getting them ripe enough at Lake Minnetonka.

Mr. Gould. If the grape can be ripened anywhere in the State this year before the 12th of September, so as to be fit for exhibition, I think Mr. Latham, at Excelsior, can get them ready. It depends upon the weather for the next month. I think there is an even chance for the earlier ones, perhaps an extended list.

Mr. Brimhall. The only question seems to be whether we can get the fruit for a good exhibition. Upon the assurances given us on that point, I am in favor of appointing our Secretary as our representative in connection with Prof. Porter. and place the whole matter of collecting and taking on the fruit in his hands, and that he make as good a display as possible; and I make a motion to that effect.

Mr. Brand. I second the motion.

The Secretary. Before you take any final action let us come to at least a partial understanding about the expense. I wish I could afford to give the Society my time in this matter; it would be a labor of love, for nothing suits me better than to go among and be with our fruits, but as I am situated, I should have to ask some compensation, besides the expenses incurred. I am wiling to contribute my time in attending the Philadelphia meeting, and that will probably be about my share.

Mr. Grimes. I am in favor of leaving the whole matter of expense within the limits we have estimated to the judgement of Mr. Gibbs. The Society has confidence that he will incur no more than is necessary; and as to compensation for his time in looking up and getting the fruit together, that the Executive Committee allow him what is reasonable.

Mr. Gould. From the discouraging prospects about the apple crop in our section, I had concluded not to vote one way or the other about trying to make this exhibition; but from the assurances given here, and with the understanding that the money we appropriate for the purpose will not be used, unless it is found at last that the fruits are creditable in variety and quality, I will support the motion.

The Secretary. At the February meeting of the Committee, Prof. Porter, Mr. Emery and myself were appointed a Committee to wait upon the Governor and ask his aid to secure an appropriation by the legislature for this purpose; but it was late in the session, and nothing could be done. I think there is no doubt but that Governor Hubbard is with us in the opinion that a general display of our fruits at the American Pomological Meeting will greatly add to the credit and pecuniary benefit of the State, and if we should properly present the matter through a committee, he might deem it right to defray a part of the expense from the Governor's contingent fund. I see no objection whatever to our presenting this suggestion for his consideration.

Mr. Grimes. From examination of our finances I see that we can carry out the project of this representation and fruit disply by an appropriation from our own treasury within the estimate we have made, and I think we had better adopt the motion of Mr. Brimhall, and then after we adjourn, go and see the Governor and get his aid if we can, as it is a matter of general state interest, and we can make good use of our own funds in our regular work.

The motion was then put by the Chairman and was adopted unanimously.

The Secretary. It is the understanding then that whatever the action of the Governor may be there is appropriated from our treasury a sufficient amount of money to cover all necessary expenses, within the estimate.

Mr. Grimes. That will be the understanding. The Committee then adjourned, and immediately repaired in a body to the Governor's room. Upon a statement of the facts by the Committee the Governor said he recognized the importance of having the State represented at Philadelphia, and he regretted that for want of time an appropriation had not been made by the Legislature at its last session. He would take the subject under advisement and set aside a portion of the fund placed in his hands for general State purposes, to aid in the expense of the collection of our fruits and their exhibition as suggested.

Subsequently, the Governor forwarded to the treasurer of the Society his check for $200.

Bills allowed and orders drawn:

Aug. 8, Secretary's Salary, 3d quarter	$50.00
Aug. 8, Expenses of Executive Com. to St. Paul	21.95
	$71.95

Seventeenth Annual Winter Meeting, 1884.

PROGRAM.

The order of exercises will be announced as far as practical during the session.

Morning afternoon and evening sessions — 9 a. m., 2 p. m. and 7 p. m. — each day, except Friday.

PAPERS TO BE READ.

Seventeen Years' Tests of Native, Canadian, Russian and Western Apples, in Northeastern Vermont,	Dr. T. H. Hoskins, Newport, Vt.
Physiographic Conditions of Minnesota Agriculture,	Prof. C. W. Hall, University of Minnesota
Tornadoes	A. W. Sias, Rochester, Minn.
Native Plums and the Apples of the River District of Southeast Minnesota,	O. M. Lord, Minnesota City, Minn.
A Beginning in Silk Worm Culture in Minnesota,	Mrs. H. B. Sargeant, Lake City, Minn.
Wild Flowers of Lake Pepin Valley	Miss Sara Manning, Lake City, Minn.
Adaptations in Fruit Growing,	J. C. Plumb, Milton, Wis.
Out-Door Recreations and Employments for Women,	Mrs. I. E. Tilson, West Salem, Wis.
The Waupaca Seedling Apples,	William Springer, Fremont, Wis.
Blight in Fruit Trees,	F. G. Gould, Excelsior, Minn.
Roses for the Northwest,	S. Barter, Markesan, Wis.
The Garden in Literature,	Oliver Gibbs, Jr., Lake City, Minn.

REPORTS TO BE READ.

Report of the Treasurer,	J. T. Grimes, Minneapolis, Minn.
Report of the Secretary,	Oliver Gibbs, Jr., Lake City, Minn.
Report of the Entomologist,	R. J. Mendenhall, Minneapolis, Minn.

Report of Committee on Fruit Blossoms:
Geo. P. Peffer, Pewaukee, Wis.
Prof. J. L. Budd, Ames. Iowa.

Report of Committee on Russian Apples:
Prof. J. L. Budd. Ames, Iowa.
A. G. Tuttle, Baraboo, Wis.
Knight Whipple, Northome.
F. G. Gould, Excelsior.
M. Pearce, Minneapolis.
Charles Ludluff, Carver.
Andrew Peterson, Waconia.
A. W. Sias, Rochester.
Peter M. Gideon, Excelsior.

Report of General Fruit Committee:
Prof. E. D. Porter, Minneapolis.
M. Pearce, Minneapolis.
G. W. Fuller, Litchfield.
A. W. Sias, Rochester.
R. M. Probstfield, Moorhead.
J. S. Harris, La Crescent.
O. M. Lord, Minnesota City.
W. K. Bates, Stockton.
J. M. Underwood, Lake City.
O. F. Brand, Faribault.
J. H. Brown, Lac qui Parle.
E. H. S. Dartt, Owatonna.

Report of delegate to American Pomological Society and to Wisconsin State Horticultural Society,
Oliver Gibbs, Jr., Lake City.

Report of Committee on Seedling Fruits:
Peter M. Gideon, Excelsior
S. M. Emery, Lake City.
M. Pearce, Minneapolis.
A. W. Sias, Rochester.

Report on Market Gardening and Small Fruit Raising at Lake Minnetonka,
Knight Whipple, Northome.

Report of Superintendent of State Experimental Fruit Farm,
Peter M. Gideon, Excelsior.

Report on Varieties of Grapes Tested,
Charles Ludluff, Carver.

Report of Finance Committee.

BUSINESS MATTERS.

Consideration of plan for Premiums on seedling winter apples.

Revision of fruit and ornamental tree list.

Election of Officers.

Location of next summer and winter meetings.

Plans for horticultural work in the state, searches for new seedlings, gathering and distribution of seeds and cions, etc.

MISCELLANEOUS.

Reception of the Wilder medal from the American Pomological Society.

Addresses by His Excellency Governor Hubbard, and others.

Reading and discussion of volunteer papers and letters, notes and abstracts in the hands of the secretary.

Opening and discussion of the question box.

FORESTRY DAY.

Friday, January 18th, 10 a. m.

SOME OF THE PAPERS TO BE READ.

The Timber-Culture Act — Should it be Repealed?
Dr. Franklin B. Hough, Lowville, N. Y

Adaptations in Forestry,
Hon. Geo. H. Wright, Sioux City, Iowa.

The Study of Forestry as an Important Contributor to Practical Education,
Hon. H. G. Joly, Quebec, Canada.

General discussion of the subject of forestry.

PREMIUM LIST.

APPLES.

Best display of Wealthy Apples, first, $4,00; second, $3.00; third, $2.00.

For Plates of winter apples in good condition, any variety, first premium, $2.00; second premium, $1.00. Five specimens to constitute a plate.

GRAPES.

Best plate of grapes in good keeping order, $2.00; second $1.00.

PLANTS AND FLOWERS.

Best display of ornamental and flowering plants, $5.00 and diploma.
Best floral design, $7,00; second best, $5.00; third best, $3.00.
Best pyramidal bouquet, $3.00; second best, $2.00; third best, $1.00.
Best single plant in bloom, $3.00; second best, $2.00; third best, $1.00.

VEGETABLES.

Best display of potatoes,	Diploma.
Best display of new varieties potatoes never before exhibited at a winter meeting,	Diploma.
Best display of winter vegetables,	Diploma.

Best half peck first early potatoes, first, $2.00; second, $1,00.
" " " second early potatoes, first $2.00; second, $1.00.
" " " potatoes for winter and spring use, first, $2.00; second, $1.00.
" " " early onions, first, 75 cents; second, 50 cents.
" " " winter " " "
" " " parsnips, " "
" " " table carrots, " "
Best winter squash, first, 75 cents; second; 50 cents.
Best bunch celery, " "
Best winter cabbage, " "

SEEDS.

Best display Minnesota grown garden seeds, $6.00; second best, $4.00.

MISCELLANEOUS.

Best display of canned fruits, $3.00; second best, $2.00.
Best display of jellies, $2.00; second best, $1.00.
Best jar mixed Pickles, $1.00; second best, 50 cents.
Best sample home-made vinegar, $1.00; second best, 50 cents.
Best sample comb honey, $2.00; second best, $1.00.
Best sample strained honey, $1.00; second best, 50 cents.

WORKS OF ART.

Best collection of paintings of Minnesota fruits and flowers in oil or water colors, $5.00; second, $3.00; third, $2.00.

Best single fruit painting, $3.00; second, $2.00.

Exhibitors are expected to contribute the membership fee of $1.00, unless already members of State Horticultural Societies of adjoining states.

For further information, address,

JOHN S. HARRIS,
La Crescent, President.

OLIVER GIBBS, Jr.,
Lake City, Secretary.

Minneapolis committee of arrangements.—Col. John H. Stevens, J. M. Welles, J. T. Grimes, M. Pearce.

Superintendent of Exhibits.—Prof. E. D. Porter.

MORNING SESSION.

First Day, January 15, 1884.

COLLEGE OF AGRICULTURE, MINNEAPOLIS,
Tuesday, January 15th, 1884.

The society met at 10:30 a. m., and being called to order by the president, was welcomed to Minneapolis by Col. John H. Stevens in the following address:

COL. STEVENS' ADDRESS.

Mr. President, ladies and gentlemen of the State Horticultural Society:

In behalf of the citizens of Minneapolis, I bid each one of you a most cordial welcome, and tender you their warmest hospitalities. They trust that your deliberations may be fraught with much moment to the future destinies of the Northwest. Your labors heretofore have been of such a character as to warrant this conclusion; for seldom has an organization accomplished more real lasting benefit to the people of the state, and judging the future by the past, we may expect to reap a golden harvest in the propagation of fruit, flowers, and everything else that appertains to horticulture, through your efforts. Our citizens feel honored by your presence, and will endeavor to make your sojourn with us pleasant, assuring you that we all feel greatly interested in your noble calling, which has a tendency to make our thresholds so happy.

RESPONSE OF PRESIDENT HARRIS.

Colonel Stevens and the Citizens of Minneapolis :

Wherever in the world horticulture has gained a foothold; wherever you find fruitful orchards and vineyards and the air is laden with the perfume of flowers; wherever you find a people or family who manifest a taste for choice fruits, beautiful flowers and ornamental trees, plants, and vines, you find refinement of sentiment and elegance of taste, that are a sure index of love, refinement and beauty within. This we have found in a marked degree among this people who now welcome us to their hospitality and homes, and wish us God speed in our work. Our mission is to introduce horticulture into every home in Minnesota, in county, town and city; and it rejoices us to hear that our mission is appreciated by you who dwell in this great and prosperous city. We aim to develop character, increase intelligence, improve morals and advance everything in our art that can exert an influence in improving the conditions of the human race. We aim to transform into sources of profitable pleasure the crude elements of nature, and we believe that we are making some progress. A few of us have been actively and with zeal working in and for this Society for some years. Others of us have not been identified with it so long; but all feel a common interest in its welfare, and it makes us glad today to be assured in this way that our self-sacrificing labors are appreciated and have not been in vain, and we are glad to meet again in your beautiful city, and thank you for your cordial welcome to us. We hope and believe that our meeting with you will be pleasant to us, and we will endeavor to make its proceedings interesting and profitable to you, and we certainly wish you, whether members or not, to participate with us in our discussions, and give us the benefit of your experience and observations in the great industry in which we all feel so great an interest. Again we thank you for your hearty welcome.

The President then read his annual address as follows:

ADDRESS OF PRESIDENT HARRIS.

Members and Friends of the Minn. State Horticultural Society:

This is the seventeenth annual meeting of this Society, and it finds us in a condition to accomplish greater good than has been accomplished at any previous meeting. We meet again in this familiar place, these halls sacredly dedicated to the study of scientific and practical agriculture and horticulture, and for such a meeting no more fitting place could have been selected. We have come on the invitation of the Regents and Professors of the State University and the citizens of this great and hospitable city, Minneapolis, the pride and joy of the Northwest. There is a fragrance and heartiness in the greetings we receive that assures us of a cordial welcome. All auspices are favorable and point to a pleasant meeting, and a profitable one for the cause of horticulture. We have gained a year in experience since the last annual meeting; and I trust that the deliberations and work of this meeting will prove to the people of our state and the outside world that the experiences of the year have increased our wisdom and fitted us to enter anew upon the work before us with a better understanding of the work and the methods of doing it. The year has exhibited some phases that tend to impress upon our minds that in some respects it has been a remarkable one. Beginning with the burning of the Newhall house at Millwaukee. upon the 9th of January, fires, collisions and train wrecks, earthquakes, explosions, and tornadoes, &c., followed each other in quick succession and with such fearful and unparalleled destruction to life and property as to strike dismay to the stoutest hearts. While the late and early frosts and unpropitious weather at times caused us to almost fear that the promise of "seed time and harvest" might fail us. A beneficent providence has had a care over us during all the year, and brought us into the beginning of the new year, and blessings rest upon us and upon all the institutions and people of this great state. The harvests have been good, and we have bread enough and to spare. In nearly every portion of our country the fruit crop has been a little below the average, and the apple crop was the poorest that has been known for several years, and the causes for the failure will afford topics for investigation and discussion in the various horticultural meetings of the present winter. In Minnesota, or in some portions of it, the crop of apples was fair, and comparatively much better than in other Northern States, which shows clearly that there are other causes for failure in fruits than the severe cold of winter. We open this meeting with abundant reasons for congratulation upon the growth and prosperity of our society, and the increased confidence it is gaining upon the minds of the people and the fraternal relations existing with adjoining State Societies. The noted events of the year having a bearing upon our work, and in which we are most particularly interested, have been our summer meeting in June at this place, which was a marked success, the meeting of the American Forestry Association, which took place at St. Paul during my absence from the State, and the meeting of the American Pomological Society at Philadelphia in September, at which our Society won high honors as you will hear by the report of the delegate who exhibited our fruits upon the occasion.

HORTICULTURE AT THE FAIRS.

The horticulture at the fair the last season showed a great falling off from previous years. The fair at Minneapolis was held a few days too early in the season for apples, except two or three of the early or summer varieties. At the State Fair at Owatonna, there were less than a dozen exhibitors, and but about 40 varieties shown. Among the exhibitors who showed any thing besides Duchess, Wealthy and Siberans, were J. T. Grimes, E. H. S. Dart, Geo. Clark, S. Bates and J. S. Morris & Son. The display of flowers was fine, but not large, and was contributed by the ladies of Owatonna and Mr. Dennerlins, the only professional florist of the city, and most of them generously declined to receive any premiums.

This meager show was partly owing to the failure of the fruit in portions of the State, the injury to it from cyclones in the part of the state where the fair was held, and from changes in the premium list favoing amateurs, and making it unprofitable for professional exhibitors to pick up and bring in large collections that would carry off the best of the awards, and drive out the smaller growers. At the exposition of the Southern Minnesota Fair Association, at Rochester, the horticultural display was much better, as it contained the principal part of the fruit from the State Fair, and in addition large and fine collections from A. W. Sias, E. B. Jordan, R. L. Coterell and others. No ripe grapes were shown at any of the fairs. The display of flowers at Rochester would compare favorably with any ever made in the State, but was largely contributed by the florists, Salzer & Losey, of La Crosse, Wisconsin. It should be the aim and desire of our society to extend its benefits and influence to all the citizens of this state. I believe that some good might be done at the State Fairs, by bringing our influence into operation as a State Association of horticulturists. There is a manifest propriety in this, as Agriculture and Horticulture are kindred interests, and in every Industrial Exposition of the state, each should have a prominent representation. An exhibition exclusively of fruits and flowers draws only the ardent admirers of Pomona and Flora, and thus it loses its power for educating the masses. We should have convenient headquarters upon the State Fair Grounds, where all persons interested in horticulture can get together for consultation and the discussion and the decision of intricate questions that frequently arise, and if evening sessions were held for the investigation and discussion of suitable topics, our membership would be largely increased and it would be a convenient way for getting our publications into the hands where they may do the most good. The result would be the stimulating of the horticultural interests of the state among a large class of our citizens who are not now taking an active part with us. The State Agricultural Society has always recognized us as an auxilary and allowed us one member upon the Board of Managers, furnished space and offered very liberal inducements in the way of premiums to draw out a creditable display of our products. In just so far as we fail to assist and encourage the State Agricultural Society, in making a successful annual fair, we come short of our duty and cripple our usefulness.

We have adopted one practice which I think will result in great good to the Society. I refer to that of electing to life honorary membership such men as have conferred lasting benefits upon the Society, by long and faithful service as members, and men of this and other states, who have devoted their lives to the cause, and have acquired notoriety for their achievements in progressive horticulture or other sciences bearing intimate relations to it. I take this occasion to recommend that some action of the Society be taken whereby it shall be made a perpetual "roll of honor," and that the Secretary be instructed to arrange the names of the list in the order of their election to the honorable position, and that upon the removal of any one by death a star be prefixed to note the same, and there to remain forever. I would further recommend that the name of our lamented friend, Leonard B. Hodges, be placed upon the roll next to that of Dr. John A. Warder, deceased. Also that the name of the late Dr. P. A. Jewell, be placed upon the roll. There are a few other men to whom this Society and the cause of horticulture is indebted for able and efficient help rendered in those days when to be a working member of the Society called for self-denial, members who have given their time and spent their money freely to bring the Society to that condition that should command the notice and respect of our State Legislature that secured for us the publication of our transactions, the purchase and working of the experimental farm of which the venerable Peter M. Gideon is Superintendent, and an annual appropriation to help us in the prosecution of our work. First among these I name Col. D. A. Robertson, of St. Paul. No man in the State better deserves the highest honors, we are able to confer upon him. He stands first in point of faith and energy in the early attempts to introduce fruit culture into this state. In the winter of 1865 and 1866 he sent out circulars for information and opened a correspondence with the leading men of the state who had made attempts at fruit-growing, and he contributed to the Pioneer Press two lengthy and able articles which appeared in the issue of March 1st and March 14th 1866. Those articles were of inestimable value to the state, and proved a forerunner of the organization of this Society, which occurred in the October following, and of which he was very properly elected the first President. Next I would name L. M. Ford, formerly a prominent florist and nurseryman at Groveland, near St. Paul. In 1860 he, with Col. J. H. Stevens, edited "The Farmer and Gardener of St. Paul," and afterward for many years he filled the position of Agricultural editor to the Pioneer Press. Although he was not one of the original twelve who organized the Society, he became identified with us in the early years of our existence and rendered the society valuable and efficient aid. On January 23d, 1874, he was elected to the office of secretary, and held it for one year, discharging the duties without compensation and paying most of the office expenses, only a small part of which was ever returned to him. His labors have been labors of love, never prompted by the "almighty dollar," and now in our day of prosperity it is meet that we should show some recognition of his services. Next I will name Truman M. Smith of St. Paul an earnest, hard-working, self-denying. liberal-minded horticulturist. He became a member of this Society in 1868; has always been an efficient worker, and for many years discharged the duties of President with honor to himself and profit to the Society, and he has done very much to encourage and advance fruit culture in the state by the magnificent displays of fruit he has at various times made before this society and at the State Fairs, the American Pomological Society, and at the centennial exhibition at Philadelphia, for all of which he received no compensation except only in the satisfaction of having aided in the development of the horticulture and welfare of the state. Next J. T. Grimes, of Minneapolis, who became a member in 1868, has continued with us and one of us and been an earnest worker ever since. He has been a delegate from this Society to the special meeting of the American Pomological Society, and the manager of the centennial display of fruits for this Society without expense or charge to us and to his efforts, with those of Wyman Elliot and a few liberal minded fruit growers too poor in purse to do more than donate fruits, we are largely indebted for the award of a diploma and medallion, which contributed very largely to influence the Legislature to donate to our society, annually the sum of $1,000 to aid us in pursuing our noble work. He has also attended as our delegate the meeting of the Mississippi Valley Horticultural Society in 1880, and superintended an exhibition of fruits for the Society and defrayed the principal part of the expense. The last name that I shall present at this time is that of our modest friend, A. W. Sias, of Rochester. He was in at the birth of the Society, consequently is one of the "original twelve" fanatics who started the Society, and set the good work in motion, that is destined to push Minnesota into the front ranks as one of the fairest and best among the great sisterhood of free and enlightened states. He has kept up his membership except for a single year, and has filled the offices of Treasurer and Vice-President and has never been honoured so much by the Society as to receive the appointment of delegate to represent us before any other Society. These all are old worthies whose names and deeds will be held in reverence by future generations. They have done the work for nothing, and with others have paid for the privilege. Let us not longer fail to recognize their worth and remunerate them so far as in our power lies, and may the Minnesota State Horticultural Society never want for scores of such liberal true-hearted men to conduct her affairs and bear her on to the victory.

LOCAL AND COUNTY SOCIETIES.

The Minnesota State Horticultural Society is legally constituted, and has its duties and obligations. Article 2d of the enactment-reads—" The object of the Society shall be to collect, condense, and collate information relative to all varieties of fruits, flowers, and other horticultural productions and dispense the same among the people." The most thorough and economical way of doing this would be through the agency of local and county societies. In order to help us to carry out this provision of the law the Legislature granted to us an annual appropriation of $1000. It is our sacred duty to see that this appropriation is properly and honestly used, where it will count the most. Education in horticulture is the crying want of the state. The most practical means for acquiring such education is through horticultural literature and horticultural societies. In horticultural meetings the experienced and practical, and those seeking information, are brought together. The experienced lose nothing in imparting information to others, the inexperienced gain much useful knowledge and are awakened to increase it by the study of the literature and the conducting of practical experiments. The time has arrived when there should be a society in every county, and to start such we should lend every aid in our power, and I recommend the setting apart of $200 for the purpose of defraying the actual expenses of suitable persons to go out among the people and lecture, and organize such societies, to be paid after the work is done and approved by this society.

I think it would also be well to adopt a system of society membership. The Indiana society admit members into their society upon the presenting of a certificate of membership from their secretary and the payment of fifty cents, and report that it is working satisfactorily. We would thereby increase our own membership and give such societies an interest in us.

I farther recommend that a little of your attention be given to the subject of experimental stations. The Executive Committee have appointed twelve superintendents of such stations. As the work cannot be prosecuted without incurring some expense to the superintendents, this meeting should see that some arrangements are made to defray the expense of procuring seeds, scions, stocks to graft upon and postage and express, and charges for such of the superintendents as will engage in the work. The amount neces- would range from $10 to $25 for each station, until they are well underway. We have a constitution and by-laws; most of our new and some of our old members have never seen it. It would be well to direct that it be published annually in our transactions as a convenience for reference and guide to our work.

In Memoriam.

The year since our last Annual Meeting has been marked by the decease of an unusual number of noted men, and a number of prominent horticulturists are enrolled among the departed. I alluded to our departed associates, Hodges and Bowen, in my address before the summer meeting, and now it becomes my painful duty to mention the decease of two more noble men, who had endeared themselves to western horticulturists.

Arthur Bryant died at his residence in Princeton, Illinois, in March, 1883. Although not a member of our society, he had taken a great interest in the conservatism of our forests and the planting of new ones. He has held important positions in horticultural associations, contributed freely to public journals and was the author of the valuable book "Forest Trees for Shelter, Adornment and Profit," and he was in the fullest sense, a thoroughly educated and upright gentleman.

Dr. John A. Warder, who for distinguished services in our cause was two years since elected a life honorary member of this society, died on the 14th of July, aged seventy-one years. Hon. Marshal P. Wilder in speaking of him says: "No death has occured in this Society (the American Pomological) since that of Andrew Jackson Downing which is more deeply lamented; his was a useful, generons, unselfish life. Beloved in life, his death was universally and deeply deplored: No; he is not dead, but has gone before us to pertake of the everlasting fruits of the tree of life."

M. Cutler moved that a committee of three be appointed to consider the recommendations in the President's address. The motion prevailed, and Col. J. H. Stevens, G. W. Fuller, and J. T. Grimes were appointed to such committee; and G. W. Fuller, A. W. Sias, and M. Pearce were appointed as a Committee of Finance.

A communication was received from the Delta Sigma Society of the State University tendering the use of their room for the meetings and on motion it was decided to hold the evening meetings there, and to arrange the program so as to be as attractive as possible to a general audience.

AFTERNOON SESSION.

Tuesday, January 15th.

The session was opened by musical selections by the University Glee Club.

The committee on President's address reported as follows:

REPORT OF THE COMMITTEE ON THE PRESIDENT'S ADDRESS.

The Committee to whom was referred the President's annual address would respectively report:

That they have considered the various matters suggested by the President in his annual address, and find them all worthy of consideration. In the opinion of your committee a closer connection should be made with all societies of a kindred nature; that the State Society should extend its helping hand to local, district and county societies; that a greater effort should be made to add to the membership of the State Society, and, finally, your committee feel it to be their duty to congratulate the society on its highly prosperous condition, which we feel in a measure is due to the efficiency of its officers.

Your committee recommend that the following names be added to the roll of honorary life members of this society: P. A. Jewell, Leonard B. Hodges [(deceased), L. M. Ford, J. T. Grimes, and A. W. Sias. Respectfully submitted,

J. H. STEVENS,
G. W. FULLER.

On motion the report was adopted.

Credentials were presented by J. C. Plumb, of Milton, Wisconsin, as delegate from the Wisconsin Horticultural Society, and on motion of Peter M. Gideon, it was voted to make Mr. Plumb an honorary life member of this society in consideration of his long and useful service in western horticulture.

Mr. Plumb thanked the society for the honor conferred on him and pledged his hearty co-operation with us in our work hereafter.

Prof. Porter on behalf of the Board of Regents extended a welcome to the members of the society to the buildings and grounds of the University, and especially invited them to visit the workshops and see the students in mechanics at their employments therein.

The Secretary's and Treasurer's annual reports were then read, as follows, and referred to the Financial Committee:

ANNUAL REPORT OF THE SECRETARY.

Mr. President and Members of the State Horticultural Society:

The year now closing has been a busy one for the Secretary and an eventful one for the society.

OUR ANNUAL REPORT.

At the close of our last annual meeting we found ourselves in possession of material for an annual report that might rank in size and contents with the best horticultural reports of other Western States, but hampered with a printing law that while professedly allowing us a volume of 300 pages—1,000 copies in cloth and 4,000 in paper covers—was yet so worded and so restricted as to cost as to make it entirely uncertain what it would be, and place it out of our power to prepare it intelligently for the press. As an illustration of its workings, the previous year we were directed to cut down our carefully prepared manuscript, which was done; then the State printer gave us another cut by introducing a lot of fine type, so, as he said, that it might be reduced to 300 pages, or get within the limit as to cost; and when the report finally came out, it contained only 135 pages, and the fine type made it almost unreadable. The difficulty lay in the limit of $750 instead of having the limit solely on the size of the volume and the number of copies, leaving the cost to be governed by the printer's contract with the state for the printing and binding of that amount of matter; and as it was operating so badly with us, being a discouragement rather than an incentive to the improvement of our work, an effort was made to get the law amended. Early in February, under instructions from the executive committee, I drew an amendatory bill, placed it in the hands of Hon. S. M. Emery, of the lower house of the legislature, who took charge of it, and it became a law. It was thought that for the present we could do with a less number of copies than the old law ostensibly gave us, and so the new bill was drawn for 3,500 copies instead of 5,000 as was before, the number of pages increased from 300 to 500 as a maximum limit, and the whole edition to be bound if necessary. Practically we did not ask an order for binding the whole edition, and probably never shall. We can always use a part in paper covers, and it is to our interest as well as our duty to economize for the state as much as possible in the matter. Up to 1883 we have never been able to get enough bound copies to supply our members and exchanges. Only a favored few could secure a bound volume; the rest had to take paper covers—mere pamphlets—which are presumed to have gone usually the way of pamphlets: first down flat on the shelves around the house, dust covered, disarranged and always in the way; then up garret, and finally to the rag gatherer for a tin whistle; and when wanted for reference to help out of a difficulty in the garden or orchard, never found. Now, friends, thanks to the liberality of the legislature, we have a volume that we are not ashamed of. It is printed in large type so that the old folks can read it in the evening; it can stand alone on the library shelf; its back is broad enough to have a title there that can be distinguished from other books; it is popular; folks want it; one member of the legislature asked me for 200 copies; I get any quantity of letters complimenting it; we are not ashamed to send it to Iowa, Wisconsin, Kansas, Illinois or Michigan, asking an exchange for their reports. It is a standard that we must respect for oursilves; improve it as much as possible, but never go below it. It will oblige us to always have good programs at meetings and do our level best to put in our time to advantage; and lastly, as I know from the experience of the last six months, it gives us a reputation that needs only good honest work on our part hereafter to secure the services of the best writers in the horticultural world for future volumes. Says one of the leading writers of papers at this meeting—a writer from abroad, of continental fame: "I consider it an honor to write for your report." Said another: "I value it too highly not to be anxious to earn a copy of the next one by writing a paper for it." And I have no fear, if we keep on in well doing, that the legislature will repeal our law; but rather, if the people want more copies, they will be provided. If we grow dull, lazy or trifling, they ought to repeal it.

THE REPORT FOR 1884.

That the report for 1884 need not be a retrograde, but rather an advancement, the materials now in hand, and the prospects for this meeting, afford good promise.

EXPENSES OF DISTRIBUTING REPORTS.

By the change in the printing law the expense of the distribution has to be borne by the society.

Previous to that, by a construction of two acts in reference to our society, not in harmony with each other, the Secretary of State furnished a part of the postage. At the summer meeting an appropriation of $75 was made for this expense, but it was not enough, and while the law remains as it is, it will be necessary to estimate the cost of postage on the distribution at $100 per year at least, in order that it may be promptly done, and to our best advantage, until we succeed in having local societies organized that will take them by express or freight in bundles, and attend to the distribution to members, officials and the press, for us.

EXCHANGES.

We receive in exchange a small number of copies of other state societies and from the Montreal Horticultural Society. I am in hopes soon, if we keep up the present high grade of our work, that we can get enough in exchange to supply all of our members who want them. A full file of reports of other societies is very essential to any one writing papers for our meetings, and nothing is more productive of good writing and increasing the list of writers than the distribution of this kind of literature.

THE CANADIAN SOCIETIES.

We have been deriving much benefit, for years past, from the labors of the Montreal Horticultural Society, and the Ontario Fruit Growers' Association, through the kindness of Charles Gibb of the one and President William Saunders of the other, in keeping us supplied with their reports and current literature; and now, we have a society to the northwest of us, at Winnipeg. I put here on record the names of all the officers of the Winnipeg organization for future reference, as we may reasonably expect an intimate relation with this society, and when they come to systematic trial of trees and plants to discover adaptations in that region, our northern sections must be largely the gainers by it through this relation, and otherwise.

It is called the

MANITOBA FORESTRY AND HORTICULTURAL SOCIETY.

President—J. A. Miller.

Vice Presidents—Hon. M. A. Girard, Acton Burrows.

Secretary and Treasurer—Charles N. Bell.

Directors—W. B. Hall, J. B. McKilligan, Thomas Nixon, R. R. Keith, Hon. A. G. B. Bannatyne, J. M. Miner, Asa A. Burnham.

I have sent them full files of our reports, and the Forestry Association has furnished them with *The Tree Planter's Manual* and other publications.

SOCIETIES OF ADJOINING STATES.

Since I became Secretary of the Minnesota Horticultural Society I have labored steadily to obliterate the idea of State lines, as much as possible, in the Horticultural work of all the northwestern states. The system of sending delegates to each other's conventions is doing something for this, and the correspondence and reciprocal work of the secretaries is doing still more. It is to this idea that we owe the fact that we are not much behind Iowa in our present awakening to the subject of Russian adaptation of fruit and forest trees and plants, and pretty well up with Wisconsin in the study of fruit blosoms, geological and climatic adaptations. Think a moment, fellow members. Suppose that a year ago Prof. Budd had responded, substantially like this, to my application for his notes on Russia. "Oh no, we cannot do that; your report might get out ahead of ours; we are working for Iowa; Iowa must take the lead, and have the preference; wait and get the facts you want from our report." What would have been the result? Just one year's delay in spreading the facts before our people. Turn a look inward on your own thoughts now on this subject, and see how far ahead your are, how much your mind has been influenced by this prompt publication which Prof. Budd, in the largeness of his views, enabled us to make. Blot out these Russian pages from our Report of 1883, and think with what snail-like pace and mole-like vision we should now be groping. In the same spirit I have contributed whatever materials I had in hand freely whenever asked for by other Secretaries, and a glance at our program will show any one, that our work at this meeting is to be very much benefited by contributions from other states.

In reference to some topics neccessary to be treated of at this meeting to round out our program, I was utterly unable, after repeated invitations sent out, to engage a suitable writer from our own State, and it was only after attending the meetings of other societies that the vacancy was supplied. And this reminds me to say, that so long as the laboring oar in correspondence, the selection of topics and writers for our programs, in getting up the current horticultural points of the year, used in the compiling and editing of the Annual Report, rests upon the Secretary, he should, in order to do himself and the society justice, and in order to fairly bear the responsibility that he is held to for a good report, be an *ex officio* delegate to all the Horticultural and Pomological Societies, at which meetings our society is to be represented, whenever he can attend them, with such other of our members as may be appointed.

MEMBERSHIP.

Our membership is steadily but too slowly increasing. I would again urge you to devise some scheme of canvassing to secure a larger constituency. We have only about one hundred members; we ought to have a thousand. What is our mission? To push fruit culture—yes, apple growing—to the northrn limit of the wheat plant; to make it successful everywhere in the Northwest; to find or make the winter apple that shall unite to the beauty and quality of the Wealthy, the keeping qualities of the Willow Twig, the winter hardiness of the Transcendent and the non-blighting of the Duchess of Oldenburg. To find the adaptation and the proper culture of forest trees and domestic plants for all our varied belts of soil and climate ; to overcome the dificulties of all tree culture and all horticulture ; to promote a love and practice of rural adornment around the homes of our people. Surely, these are aims good enough and popular enough to enlist public interest and extend our membership if we go about it right. But if the mountain will not come to Mahomet, what then? Mahomet must go to the mountain! If the one thousand members do not come to us, we must go to them, with the press gang of persuasion and a copy of our report, including the back numbers, and bring them in. In a word we need to set afoot some good missionary work. It will pay now, and pay still better hereafter; for in horticulture there are no backsliders.

THE PRIZE ESSAYS.

A few days before the departure of Wyman Elliot for California, I received a notice from him that the committee on the essays about Orcharding in Minnesota had awarded the prize of twenty-five dollars to Hon. R. P. Speer, of Cedar Falls, Iowa. An order for the amount was drawn on the treasurer and sent to Mr. Speer, and it has been paid. The prize on the essay on Seedling Fruits was awarded to Mr. Peffer, and that also has been paid.

THE AMERICAN FORESTRY CONGRESS.

At the summer meeting of our Society a resolution was presented by Col. Stevens and adopted, expressive of our good will and hospitality towards the American Forestry Congress to assemble August 8, in St. Paul. I attended this session of the Congress, and did what I could to carry out the spirit of the resolution. Copies of our report of this year were furnished to the members in attendance with the compliments of our Society, under instructions from the Executive Committee, and a resolution of thanks was passed therefor. On the second day of the session I had the honor of receiving from the ladies of the Jewell Nursery at Lake City, a large shipment by express of cut flowers in button hole bouquets, baskets, hand bouquets, &c., and of presenting the same to the Forestry Congress with the compliments of the donors and of the State Horticultural Society. They were turned over by the President of the Congress to Hon. H. G. Joly of Quebec, for distribution to the members, and the occasion formed a pleasant episode in the closing hour of the session.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

I also attended the meeting of this Society a portion of its time to see what could be found for the advancement of horticulture. Its biological section under the charge of Prof. Wm. J. Beal, of the State Agricultural College at Lansing, Michigan, and who is also Secretary of the American Pomological Society, discussed with the zeal and accuracy of scientists several questions of importance to our branch of agriculture.

But what I prized most in having the privilege of attending both these meetings was the opportunity to become acquainted with the prophets and seers of horticulture and forestry in attendance, men of distinction in the great knowledge they possess, and whose acquaintance is, to borrow an expression used long ago in reference to another, "a liberal education."

Even a mere synopsis of points from the meetings would take too much time and space. The most that can be done now is to refer students of horticulture and forestry to their reports when published.

GENERAL BUSINESS.

Our constitution requires the Secretary to report to the Society an abstract of the matter that has come into his possession. In pursuance of this, I call your attention to a copy of the rules of the American Pomological Society, and a portion of President Wilder's address relative thereto, recently sent out by the secretary under a resolution of that Society for the action of kindred societies, and recommend that this matter be referred to a committee to report at our next annual meeting or sooner, if desirable, the rules and the portion of the address referred to to be first printed in our annual report, and which are as follows :

"AMERICAN POMOLOGICAL SOCIETY."

At the recent meeting of the American Pomological Society held in Philadelphia, Mr. J. B. Rogers, of New Jersey, made the following motion, which was unanimously adopted: "That the Secretary of this Society be instructed, at an early day to send copies of our rules and the portion of the President's address referring to the names of fruits, to all kindred societies in America."

MARSHALL P. WILDER, President,
Boston, Mass.
W. J. BEAL, Secretary,
Lansing, Mich.

The rules adopted, and the portion of the President's address referred to are as follows:

RULES OF THE AMERICAN POMOLOGICAL SOCIETY.

SECTION I.

NAMING AND DESCRIBING NEW FRUITS.

Rule 1.—The originator or introducer (in the order named) has the prior right to bestow a name upon a new or unnamed fruit.

Rule 2.—The Society reserves the right, in case of long, inappropriate, or otherwise objectionable names, to shorten, modify, or wholly change the same, when they shall occur in its discussions or reports; and also to recommend such changes for general adoption.

Rule 3.—The names of fruits should, preferably, express, as far as practicable by a single word, the characteristics of the variety, the name of the originator, or the place of its origin. Under no ordinary circumstances should more than a single word be employed.

Rule 4. Should the question of priority arise between different names for the same variety of fruit, other circumstances being equal, the name first publicly bestowed will be given precedence.

Rule 5. To entitle a new fruit to the award or commendation of the Society, it must possess (at least for the locality for which it is recommended) some valuable or desirable quality or combination of qualities, in a higher degree than any previously known variety of its class and season.

Rule 6.—A variety of fruit, having been once exhibited, examined, and reported upon, as a new fruit, by a committee of the Society, will not thereafter, be recognized as such, so far as subsequent reports are concerned.

SECTION II.

COMPETITIVE EXHIBITS OF FRUITS.

Rule 1.—A plate of fruit must contain six specimens, no more, no less, except in the case of single varieties, not included in collections.

Rule 2.—To insure examination by the proper committees, all fruits must be correctly and distinctly labeled, and placed upon the tables during the first day of the exhibition.

Rule 3.—The duplication of varieties in a collection will not be permitted.

Rule 4.—In all cases of fruits intended to be examined and reported by committees, the name of the exhibitor, together with a complete list of the varieties exhibited by him, must be delivered to the Secretary of the Society on or before the first day of the exhibition.

Rule 5.—The exhibitor will receive from the Secretary an entry card, which must be placed with the exhibit, when arranged for exhibition, for the guidance of committees.

Rule 6.—All articles placed upon the tables for exhibition must remain in charge of the Society till the close of the exhibition, to be removed sooner only upon express permission of the person or persons in charge.

Rule 7.—Fruits or other articles intended for testing, or to be given away to visitors, spectators, or others, will be assigned a separate hall, room or tent, in which they may be dispensed at the pleasure of the exhibitor, who will not however, be permitted to sell and deliver articles therein, nor to call attention to them in a boisterous or disorderly manner.

SECTION III.

COMMITTEE ON NOMENCLATURE.

Rule 1.—It shall be the duty of the president, at the first session of the Society, on the first day of an exhibition of fruits, to appoint a committee of five expert pomologists, whose duty it shall be to supervise the nomenclature of the fruits on exhibition, and in case of error to correct the same.

Rule 2.—In making the necessary corrections, they shall, for the convenience of examining and awarding committees, do the same at as early a period as practicable, and in making such corrections they shall use cards readily distinguishable from those used as labels by exhibitors, appending a mark of doubtfulness in case of uncertainty.

SECTION IV.

EXAMINING AND AWARDING COMMITTEES.

Rule 1.—In estimating the comparative values of collections of fruits, committees are instructed to base such estimates strictly upon the varieties in such collections which shall have been correctly named by the exhibitor, prior to action thereon by the committee on nomenclature.

Rule 2.—In instituting such comparison of values committees are instructed to consider:—1st, the values of the varieties for the purposes to which they may be adapted ; 2d, the color, size, and evenness of the specimens ; 3d, their freedom from the marks of insects and other blemishes ; 4th, the apparent carefulness in handling, and the taste displayed in the arrangement of the exhibit.

T. T Lyon, South Haven, Mich.,
John A. Warder, North Bend, Ohio,
J. J. Thomas, Union Springs, N. Y.,
C. M. Hovey, Cambridge, Mass.,
P. J. Berckmans, Augusta, Ga.
Committee.

EXTRACT FROM PRESIDENT WILDER'S ADDRESS.

In former addresses, I have spoken to you of the importance of the establishment of short, plain, and proper rules, to govern the nomenclature and description of our fruits, and of our duty in regard to it ; and I desire once more to enforce these opinions on a subject which I deem of imperative importance. Our society has been foremost in the field of reform in this work, but there is much yet to be done. We should have a system of rules consistent with our science, regulated by common sense, and which shall avoid ostentatious, indecorous, inappropriate, and superfluous names. Such a code your committee have in hand, and I commend its adoption. Let us have no more generals, colonels, or captains attached to the names of our fruits; no more presidents, governors, or titled dignitaries; no more monarchs, kings, or princes; no more mammoths, giants, or Tom Thumbs; no more nonsuches, seek-no-furthers, ne plus ultras, hog-pens, sheep-noses, big bobs, iron clads, legal tenders, sucker states, or stump-the-worlds. Let us have no more long, unpronounceable, irrelevant, high flown, bombastic names to our fruits, and, if possible, let us dispense with the now confused terms of Belle, Beurre, Calebasse, Doyenne, Pearmain, Pippin, Seedling, Beauty, Favorite, and other like useless and improper titles to our fruits. The cases are very few where a single word will not form a better name for a fruit than two or more. Thus shall we establish a standard worthy of imitation by other nations, and I suggest that we ask the co-operation of all pomological and horticultural societies, in this and foreign countries, in carrying out this important reform.

As the first great national pomological society in origin, the representative of the most extensive and promising territory for fruit culture, of which we have any knowledge, it became our duty to lead in this good work. Let us continue it, and give to the world a system of nomenclature for our fruits which shall be worthy of the society and the country,—a system pure and plain in its diction, pertinent and proper in its application, and which shall be an example, not only for fruits, but for other products of the earth, and save our society and the nation from the disgrace of unmeaning, pretentious, and nonsensical names, to the most perfect, useful, and beautiful productions of the soil the world has ever known.

Your attention is also invited to the following circular relative to a proposed international exhibit of fruits at New Orleans next winter:

AN INTERNATIONAL EXHIBITION OF FRUITS.

I desire to announce to all fruit growers, and to all persons interested in Horticulture, that an arrangement has just been effected by which we hope to secure in the winter of 1884–5 the most extensive and complete exhibition of fruits and other horticultural products that has ever been made.

The World's Industrial Exposition will open in New Orleans on the first Monday in December, 1884, and continue for six months. This will be in the largest sense a World's Exposition of Industry, and will in many essential features surpass any exposition heretofore held in this or any other country. The provisions being made for this great fair are of the most generous character. The main building, now in course of erection, will cover thirty-two acres of ground, and will give far more exhibition space than any structure heretofore erected in this country. An Art Building, an Agricultural Building, and a Horticultural Building, and other structures for special purposes, will all give most liberal accommodations to these several interests.

There are many favorable conditions which lead to the belief that this World's Fair will be more extensively visited, especially by agricultural people, than any fair heretofore held. The season is the one of greatest leisure for the rural classes, instead of one of greatest activity. It is the season when everybody at the North wishes to go South to escape from some portion of the trying northern winters. The city of New Orleans—the great commercial metropolis of the South—is full of novel attractions for the stranger, and has the mild winter climate of the Gulf of Mexico. And arrangements are already effected with all the great railroad lines leading to the city for passenger rates without parallel for cheapness.

Under all these favoring circumstances it seemed desirable that something more should be done for the great interests of horticulture, especially for those of pomology, than has hitherto been attempted. So it has been decided by the board of managers to give these interests a larger place than they have held in any other fair in the world. In addition to the completest possible display of trees, plants, and flowers, there will be held an international show of fruits. This has never before been done, or even attempted. This department will be organized and managed by the Mississippi Valley Horticultural Society.

The exposition managers will erect a building especially adapted to a display of plants and fruits. This Horticultural Building will be about six hundred feet long by one hundred feet wide, and will be a handsome and convenient structure, which, with the landscape embellishments adjacent, will cost $100,000. They will, at an early day, issue a list of premiums for fruits, in medals and money, which will aggregate from $12,000 to $15,000. We expect to secure an exhibit of all such fruits as will be in season at any part of the period of six months during which the exposition will continue, or as can be held over by the most efficient system of cold storage. We expect these exhibits from every state and territory of the United States; from the provinces of British North America; from Mexico and the Central American States; and from all the important nations of the world. The same classes of fruits from all the temperate climates of the globe will be placed side by side for comparison. The citrus fruits, and others of great commercial value, will be gathered from the Gulf States, from California, from the Mediterranean countries, from South America, from India, China, and the islands of the sea.

This exhibition will be continuous for the whole term of the exposition, showing every fruit in its season, and continuing many kinds beyond their season by the help of cold storage. The most ample and complete cold storage facilities to be found on the continent have been placed in control of the management by the New Orleans Refrigeration Company.

Thus it will be seen that an Industrial Fair Association has at last been found, able and willing to recognize the importance of horticulture and the great fruit interests of this country and the world, and to provide for their exhibition in the most liberal spirit as one of the most important and attractive departments of a world's exposition. I cannot be mistaken in my belief that these generous invitations, which are wholly without precedent in the history of fairs and expositions, will be responded to by the fruit growers, and the agricultural and pomological societies of this and other countries; and that we shall see in New Orleans next winter such a varied and profuse exhibition of the pomological wealth of all nations as the most enthusiastic horticulturist has not dreamed of beholding, and which will be of incalculable benefit to the vast interests represented.

Premium lists will be issued at an early day for distribution to all interested. All inquiries and applications for space should be addressed to the undersigned, at Cobden, Illinois, U. S. A.

PARKER EARLE,
President Mississippi Valley Horticultural Society, and
Superintendent Department of Horticulture,
World's Exposition, New Orleans.

I have also received the following announcement and program of the meeting of the Mississippi Valley Horticultural Society to be held at Kansas City, Missouri, next week:

THE MISSISSIPPI VALLEY HORTICULTURAL SOCIETY.

The fifth annual meeting of this Society will be held in Kansas City, Missouri, on Tuesday, Wednesday, Thursday and Friday, January 22d, 23d, 24th and 25th, 1884. President's address and officer's report at 2 p.m., 22d.

The prestige that the Mississippi Valley Horticultural Society has already gained, as the head of the system of horticultural organizations within the great and prosperous valley, from which it takes its name; the very excellent program herewith presented, including as it does, leading horticulturists and fruit growers from all parts of the country; the fact that this meeting is to be held in the most progressive and enterprising city in the West, and, that the Society goes to Kansas City as the guest of the Missouri State Horticultural Society, are of themselves a sufficient guarantee that the meeting will be a grand one.

This meeting is purposely fixed at a time when farmers and fruit growers are resting from the toils of the year, and when they can best spare a few days time in mutually improving their minds, through such facilities as meetings of this kind only can afford. It also comes after the close of all state and importtant local society meetings, thus bringing together its membership fresh from their respective schools of horticultural knowledge.

A VOLUNTARY EXHIBITION

Of fruits and other horticultural products will be made in connection with the meeting, and as this occurs in one of the best fruit regions of our country, we feel confident that this feature will prove of great interest to all who may attend.

ENTERTAINMENT.

The St. James Hotel will be headquarters, at two dollars per day. Barnum's Hotel $1,and other hotels at from $1 to $2 per day.

RAILROAD ARRANGEMENTS.

The Missouri Pacific System of roads, including the Wabash, and embracing about ten thousand miles of road, extending as far north and east as Chicago, Detroit, and Toledo, and as far south and west as New Orleans, Galveston and El Paso, will return members in attendance, who have paid full fare over these lines, at one cent a mile, upon the certificate of the secretary of the society. The Chicago & Alton, C. B. & Q. Keokuk, St. L. & N. W., Chicago, B. & K. C., Illinois Central, Cairo Short Line and Hannibal & St. Joe roads will return members on the same terms. The Ohio & Mississippi will sell tickets to St. Louis and return at one and one-third fare, to members indorsed by the Secretary. The Louisville and Nashville will give reduced rates to members, applying to its Gen. Passenger Agent, C. P. Atmore,of Louisville, Kentucky.

THE TRANSACTIONS.

Including the valuable papers promised in this program, together with a full synopsis of all discussions upon topics presented during the meeting, will be published in a style corresponding with the first volume of proceedings issued during the last year; a volume which has called forth high enconiums from eminent horticulturists and pomologists. Members will be supplied by mail with a copy without further cost. A limited number of new members can be supplied with copies of the past volume for $1.00 in addition to the membership fee.

MEMBERSHIP.

The fee of membership is $2.00 per annum. This may be paid at the meeting, or remitted, in any safe manner, to either of the undersigned, prior to the meeting, or soon thereafter. Those unable to attend the meeting are requested to remit the fee of membership as above, and in due time they will be supplied with a copy of the transactions.

BUSINESS DIRECTORY.

In addition to the usual features of such volumes, the transactions will contain a business directory for those engaged in horticultural pursuits, either as producers of fruit and vegetables for market, as growers of trees and plants for sale, as manufacturers of fruit and vegetable boxes and packages; as commission men and dealers, as seedsmen and florists, or as manufacturers of agricultural implements and machinery.

This directory will be plainly printed in uniform type, with two lines of space given each patron. The Directory fee is $5.00 or $3.00 to those already members of the society. No name will be admitted unless accompanied by satisfactory reference. Each patron of the Directory will be furnished a copy of the transactions, free by mail. It is the desire of the Society to furnish in this way a reliable medium of advertising between parties mutually interested.

PARKER EARLE, President,
Cobden, Illinois.

W. H. RAGAN, Secretay,
LaFayette, Indiana.

J. C. EVANS, Treasurer,
Harlem, Missouri.

PROGRAM OF THE MEETING.

The following papers will be presented to the Mississippi Valley Horticultural Society, at its fifth annual meeting in Kansas City, Missouri, January 22d, 23d, 24th, and 25th, 1884, and in such succession as may be determined by the committee on order of business. Their presentation will be followed in each case by such discussion as may be suggested by the writers. These papers will be brief and practical, the object being to bring out the points of interest in the discussions that may follow.

1. Circulation of Sap....... ....Prof. J. W. Robson, Cheever, Kan.
2. Trees Peculiar to Texas.......................T. V. Munson, Denison, Texas.
3. Some Experimental Work in Forest Tree Culture ....Prof. W. R. Lazenby, Columbus, O.
4. Supplemental Report on Insects Affecting the Strawberry,..... ....S. A. Forbes, Normal, Illinois.
5. The Fruits and Climate of North-Eastern Europe ....Prof. J. L. Budd, Ames, Iowa.
6. Forests and Timber Interests of Puget Sound................ ....Ex-Gov. Robt. W. Furnas, Brownville, Nebraska.
7. Ornamental Trees and Shrubs of Alabama................ .... Dr. Chas. Mohr, Mobile, Alabama.
8. Recent Discoveries Concerning Grape Rot ....Prof. Wm. Trelease Madison, Wisconsin.
9. Horticulture in Ontario .... D. W. Beadle, St. Catharine's, Ontario.
10. The Educational Power of Horticulture. Mrs. G. A. Tryon, Galesburg, Ills.
11. Strawberry Culture ....J. H. Hale, South Glastonbury, Connecticut.
12. Berry Culture along the Atlantic Coast ....J. T. Lovett, Little Silver. New Jersey.
13. Our Future Peach Supply ... Chas. W. Garfield, Grand Rapids, Michigan.
14. Semi-Tropical Fruit Culture. . ... E. M. Hudson, New Orleans, Louisiana.
15. Horticultural Exhibitions : How to Conduct Them .... Major Z. S. Ragan, Independence, Missouri.

16. The Peach Interests in the Central States ....Pres. J. S. Beatty, Simpsonville, Ky.
17. Orcharding on the Plains ....G. C. Brackett, Lawrence, Kansas.
18. Horticultural Resources of the Mountain Region..D. S. Grimes, Denver Col.
19. Ornamentation of Homes ....E. Y. Teas, Dunreith, Indiana.
20. Small Fruits for the Family and How to Have Them ....Pres. Sylvester Johnson, Irvington, Indiana.
21. Selection and Arrangement of Trees and Shrubs for a Country Place............................... Prof. W. J. Beal Lansing, Michigan.
22. How to Save the Apple Crop........J. S. Woodward, Lockport, New York.
23. Stone Fruit Cultivation in California ....Prof. Geo. Hussman, California.
24. The New Grapes................... Geo. W. Campbell, Delaware, Ohio.
25. Cultivation and Marketing Raspberries.. Pres. N. H. Ohmer, Dayton, Ohio.
26. Grapes that Succeed in Missouri and Kansas ....Samuel Miller, Bluffton Missouri.
27. Horticultural progress in the South....Dr. Samuel Hape, Atlanta, Georgia.
28. Conditions of Profitable Fruit Culture in Minnesota...................................Oliver Gibbs, Jr., Lake City, Minnesota.
29. Blossom Blight in the Apple.........Geo. P. Peffer, Pewaukee, Wisconsin.
30. Pear Culture in the Southwest...Maj. S. H. Nowlin, Little Rock Arkansas.
31. Experiments at Agricultural Colleges.............................Prof. J. J. Colmant, Agricultural College, Mississippi.
32. Market fruits of Kansas City..........L. A. Goodman, Westport, Missouri.
33. Gardening for Distant Markets........J. E. Porter, Humboldt, Tennessee.
34. The Best Methods of Fruit Transportation..F. A. Thomas, Chicago, Illinois.
35. The Best Fruit Packages.............E. T. Hollister, St. Louis, Missouri.
36. The value of Careful Packing and Handling...E. H. Williams, Indianapolis, Ind.
37. The Trunks of Apple Trees........Prof. T. J. Burrill, Champaign, Illinois.
38. Noxious Insects of the Orchard........Hon. J. N. Dixon, Oscaloosa, Iowa.
39. Horticultural Experimentation..Prof. James Cassidy, Fort Collins, Colorado.

In a letter from President Earle, which is in the hands of the Chairman of our Executive Committee, Mr. Underwood, our Society is strongly urged to send a delegate to the Kansas City meeting, both with reference to the business of the Mississippi Valley Horticultural Society, and for consultation with reference to the proposed international exhibition of fruits, at the World's Fair, in New Orleans. I would recommend the appointment of a committee to take both these announcements and President Earle's request into consideration.

COLLECTION AND DISTRIBUTION OF SEEDS AND CIONS.

Pardon me for taking up your time now by the introduction of this subject; but I am so impressed with a sense of its importance, that I cannot forbear. Seeds of our hardiest and best old seedling apple trees, and younger ones, if they have been subjected to any severe tests and seem hardy, should be gathered up and distributed to grow stocks for grafting and for crossing in the blossoms. None should be allowed to go to waste till we have enough put out to test the various practical questions involved: the most important of which is to determine whether among the progeny can be found any gain in hardiness, or a preservation of the hardiness of the parent, or will they be retrogrades? If hardiness is maintained or advanced, then let them grow and be used as seed-bearing parents for crossing for quality and long keeping, or for top grafting for early testing of new fruits, or for orchards on the top-work plan, or to use the seeds to grow stocks for root grafting.

Cions of the old seedling trees that are hardy where they stand and which are bearing desirable fruits, and those of other newly discovered and promising sorts, and we have a good many such, some of them long keeping apples, should be also distributed, not alone to experimental stations, but to members generally who will test them and report. I mention nothing new in this ; but introduce it for the purpose of impressing this fact, that we need to go after these cions, cut and pack them ourselves, and get them to headquarters in an expert way, as, except in rare instances, the owners of these trees are not successful in the handling of cions. An effort was made last winter to distribute some of these cions by correspondence only, and they mostly arrived dried up and dead. Nurserymen are testing all the new sorts they can find, but on a small scale ; commercially they are obliged by the necessities of business to propagate the well-known sorts that have an established reputation. Nearly all of our old seedling apple trees of apparent value and the Russian sorts promise to make this their bearing year; and this therefore is likely to be the golden opportunity to search for new aquisitions in varieties and test the fruits.

THE EXPERIMENTAL STATIONS.

Little has been done with these during the year for want of any system of collecting and distributing seeds and cions.

RUSSIAN APPLES IN CARVER COUNTY.

In my searches in August for fruit for the Philadelphia exhibit I came across a small orchard of Russian apples on the farm of Andrew Peterson, near Waconia, which I thought offered some useful lessons in the study of Russian adaptation, and which appeared to me to have a few varieties of considerable value, hitherto unknown to us, being in tree iron-clad, hardy and blight proof, and in fruit, large, handsome, productive and fairly good. In November I gathered up some cions of other sorts likely to be interesting to Mr. Peterson, from my own grounds and contributions of Underwood & Emery, and requesting Mr. F. G. Gould, of Excelsior, one of our Executive Committee, to go with me, again visited Mr. Peterson, and solicited an exchange of cions for the benefit of our Society. Mr. Peterson entered fully into the spirit of our mission, cut us a liberal supply of cions from his pet trees, many more than we could give him in exchange at the time, and entertained us hospitably. Mr. Gould will make you his report on these trees, and I will therefore only append a list of the cions received and distributed. It is expected that when the trees from these cions are ready, the new crop of cions will be cut and distributed to members of the Horticultural Society for general trial, the propagators reserving enough to compensate them for their trouble. In making this distribution we did not send to the Superintendents of all the experimental stations, but only to such as were known to be experts and having facilities for propagating. The larger share appearing in Mr. Gould's name covers an allottment for the new University farm to be delivered when Prof. Porter gets ready for them. On my return I reported the find to Mr. Gideon, who agreed to go and examine the trees and report to the society what he thought of them. Mr. Pearce has also visited them; Mr. Peterson is expected here with samples of the apples at this meeting, and on the whole if this little group of trees can stand the attention they are likely to receive, they must be extemely hardy. The following is the list:

TO WHOM SENT.	Lieby No. 240.	Charlamoff No. 262.	Hibernal No. 378.	Ostrakoff Gloss No 472.
F. G. Gould, Excelsior	4	2	6	4
Peter M. Gideon, Excelsior	2	1	2	2
O. F. Brand, Faribault	2	1	2	2
A. W. Sias, Rochester	2	1	2	2
Underwood & Emery, Lake City	2	1	2	2
Oliver Gibbs, Jr., Lake City	2	1	2	2
G. W. Fuller, Litchfield	2	1	2	2

BILLS ALLOWED AND ORDERS DRAWN.

For the purpose of comparison with the Treasurer's report at this time, the bills allowed and orders drawn from commencement of last annual meeting up to Feb. 5, will be found scheduled on pages 209 and 210 of the annual report of 1883:

Since that date they are as follows:

1883.			
Feb. 24,	Salary of Secretary, first quarter		$ 50 00
March 3,	Wyman Elliot, reimbursement for cash advanced.		100 00
" 3,	J. S. Harris, expenses to St. Paul		12.85
" 5,	Secretary, expenses two trips to Minneapolis		11.00
" 8,	G. P. Peffer, prize essay on Seedlings		25.00
May 2,	Salary Secretary, second quarter		50.00
June 28,	Premiums at summer meeting—		
	On Fruits	$23.00	
	On Vegetables	5.50	
	On Flowers	10.00	
			38.50
June 28,	H. B. McKenney, printing and stationery		13.50
" 28,	Johnson, Smith & Harrison, printing		2.00
" 28,	Mrs. James Bowen		10.00
" 28,	Secretary, office expenses (appropriation)		25.00
" 28,	Secretary, postage on Reports, "		75.00
" 28,	President's expenses to summer meeting		7.00
Aug. 8,	Secretary's salary, third quarter		50.00
" 8,	Expenses Ex. Committee to St. Paul		21.95
" 18,	O. Gibbs, Jr., delegate to Am. Pom. Soc. (appropriation)		100.00
" 25,	" " " "		*100.00
Oct. 20,	Secretary's salary, fourth quarter		50.00
Nov. 12,	R. P. Speer, prize essay, Orcharding		25.00
" 24,	O. Gibbs, Jr., delegate to Am. Pom. Soc		†188.24

FUNDS TO THE TREASURER.

Since my last annual report I have paid over to the Treasurer eighty-four dollars for annual membership fees of 1883, and have in hand eight dollars as fees of members who are to be enrolled for 1884, which will be turned over at close of this meeting. To avoid misapprehension in comparing the Treasurer's account of receipts from Secretary with the names of members as printed in the annual report, I hope the members will not forget that in the last half of the year 1882, the Secretary was directed to carry all members then joining into the roll of 1883, without further payment. Fifteen were so carried over and the funds were paid to Treasurer, July 12, $6, and December 13, $9—1882. Two of them, Mr. Hendrickson and Mr. Cuzner paid again, inadvertently, in June, 1883, and they will go upon the roll of 1884 without payment.

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*Upon this order only $60 was paid. See delegate's report.

†Includes Treasurer's items Sept. 7 and 8, Grimes and Latham. See delegate's report and report of Treasurer.

Warrants have been drawn on the State Auditor, since my last report, in favor of our Treasurer during the past year as follows:

Amount due the Society to July 1, 1883	$ 583.33
Amount due the Society July 1, to December 31, 1883	500.00
	$ 1,083.33
And the Treasurer has received also, as appears in his report, from the Governor's Contingent Fund, as a contribution for the Philadelphia exhibit of fruits of Minnesota the further sum of	$ 200.00

FINANCIAL CONDITION OF THE SOCIETY.

Our current receipts are derived from three sources only, interest on permanent fund, the annual membership fees, and the amount we receive from the State. Our disbursements are only such as are covered by orders signed and recorded by the Secretary, and the salary and incidental expenses of the Treasurer. This makes it easy to keep the run of our finances. The following will be the condition of the Treasury at the opening of the annual meeting:

Accrued interest on permanent fund	$ 43.78
Cash balance in Treasury	172.29
Total	$ 216.07

To this will be added the membership fees collected and paid over at this meeting, estimated at $100, and there is still due the Society from the State, on the appropriation for 1883, the further sum of $400. The cash on hand and the accrued interest, $216.07, as above stated, with membership fees to be received, will be sufficient to pay the balance due on current accounts, so far as they are known to the Secretary, and the premiums and expenses of this meeting, leaving the $400 due from the State as a surplus with which to begin the year 1884; add to this our State appropriation for 1884, $1,000 and the interest on our permanent fund, and deduct $200 which is to be added yearly to that fund, and we shall have about $1,200 available for current expenses of 1884.

SECRETARY'S ACCOUNT, POSTAGE, OFFICE, INCIDENTAL AND TRAVELING EXPENSES.

State Horticultural Society.	*Dr.*
Postage, including distribution of reports	$ 116 75
Express charges on reports and exchanges	13.00
Traveling expenses of secretary	24.05
Traveling expenses of delegate to Wisconsin society	24.86
Letter Heads and printing	7.00
Miscellaneous, stationery, &c	14.30

Cr.

By appropriations as follows:

1883.			
Jan. 19,	For incidental exenses	$10.00	
Jan. 19,	For delegate to Wisconsin horticultural society	20.00	
June 28,	For incidental expenses	25.00	
June 28,	For postage on reports	75.00	
	Balance due secretary	69.96	
		$199.96	$199.96

Bill of items included herewith and vouchers for information of the Finance Committee.

Many other matters of interest in the Secretary's work during the past year will come before the Society in other parts of the program and need not be introduced here, as the report is already somewhat lengthy.

I will say however in closing that the manuscript for the report of 1884, is all ready for the printers up to this date, and I am informed by our polite and wide-awake State Printers, Johnson, Smith & Harrison, of Minneapolis, that they are ready for it any time, and, if immediately supplied with the copy, they can in all probability do for us this year what we have always wanted heretofore, but could never quite accomplish—have the Report out in time for our readers to look it over before the spring planting.

In the off years of legislative sessions, like this year, 1884, when State printing is not so pressing, we may perhaps be always able to get our publication early in the spring.

Respectfully submitted,

OLIVER GIBBS, Jr., Secretary.

LAKE CITY, Jan. 5, 1884.

TREASURER'S REPORT.

Report of the Treasurer of the State Horticultural Society for the current year ending January 15th, 1884.

To the President and Secretary of the Minnesota State Horticultural Society:

The following account of the receipts and disbursements for the current year is respectfully submitted.

J. T. GRIMES,
Treasurer.

RECEIPTS.

1883.			
Jan.	16,	Permanent fund	$ 400.00
	16,	Interest (accrued)	13.00
	16,	From U. S. Hollister (former secretary)	7.00
	13,	Balance in treasury for current year	189.24
Mar.	5,	Balance State appropriation for 1882	500.00
June	26,	State appropriation from December 1st, 1882, to July 1st, 1883	583.33
		Membership fees for the current year	84.00
Aug.	8,	Of Gov. Hubbard to aid in sending delegate and making exhibit at the pomological meeting, Philadelphia	200.00
Dec.	31,	State appropriation to January 1st, 1884 (in part)	100.00
Jan.	1,	Interest on permanent fund	30.78
		Total receipts	$2,107.35

DISBURSEMENTS.

1883.			
Jan.	18,	To Oliver Gibbs, Jr., incidental expenses to date	$ 25.33
	18,	To E. D. Porter express charges	4.40
	18,	To J. T. Grimes, expense to executive committee	6.85
	18,	To U. S. Hollister, secretary office expenses	5.85
	18,	To H. C. Stearns, reporter and copying	40.00
	18,	To J. S. Harris, expense on seedling committee	7.15

	18,	To J. M. Smith, expenses from Green Bay and return		$ 25.75
	19,	To James Bowen, librarian		10.00
	19,	To Oliver Gibbs, Jr., delegate to Wisconsin 1883		20.00
	19,	Oliver Gibbs, Jr., incidental expenses		10.00
	19,	Treasurer's salary for 1882		25.00
	19,	Premiums paid at winter meeting on fruits		63.00
	19,	“ “ “ “ on flowers		9.00
	19,	“ “ “ “ on vegetables		36.25
	26,	E. H. S. Dart, delegate to Iowa		17.95
Feb.	5,	Expenses of executive committee to St. Paul		19.85
	24,	Secretary's first quarter salary 1883		50.00
Mar.	3,	Wyman Elliott, cash reimbursed		100.00
	3,	J. S. Harris, expenses to St. Paul		12.85
	3,	Oliver Gibbs, Jr. expenses to Minneapolis in connection with the annual report		11.20
	8,	Geo. P. Peffer, prize essay on seedling fruits		25.00
May	2,	Secretary's second quarter salary		50.00
June	28,	Premiums paid at summer meeting on fruits		23.00
	28,	“ “ “ “ on flowers		10.00
	28,	“ “ “ “ on vegetables		5.50
	28,	H. B. McKenney, printing		13.50
	28,	Johnson, Smith & Harrison, printing		2.00
	28,	Mrs. James Bowen, husband's salary, librarian		10.00
	28,	Office expenses of Secretary		25.00
	28,	Oliver Gibbs, Jr,. postage on reports		75.00
	28,	J. S. Harris, expenses to summer meeting		7.00
Aug.	8,	Secretary's third quarter salary		50.00
	8,	Expenses of executive committee to St. Paul		21.95
		Expense of making exhibit and sending delegate to the meeting of the American Pomological Society at Philadelphia, September 12th, 1883		
Sept.	7,	A. W. Latham, 51 lbs grapes and material for packing,	10.00	
	8,	J. T. Grimes, collecting fruits, material for packing, express charges, &c	21.20	
	8,	Oliver Gibbs, Jr., expenses to Philadelphia, including the collecting, forwarding, &c	331.34	362.54
Oct.	20,	Secretary's fourth quarter salary		50.00
Nov.	12,	R. P. Spear, essay on orcharding		25.00
1884.				
Jan.	15.	Treasurer's incidental expenses 1883		10.36
	15,	Treasurer's salary for current year		25.00
		Total disbursements		$1,291.28
Permanent fund on hand			$600.00	
Interest			43.78	
Balance in treasury			172.29	816.07
				$2,107.35

President J. S. Harris presented the following statement of services for the past year, with accompanying bill for time and expenses:

PRESIDENT'S STATEMENT.

As President of the Minnesota State Horticultural Society, I have endeavored to improve every opportunity to advance its interests, increase its membership, and awaken a general interest in the cultivation of fruits, flowers and shrubbery throughout the state, and have held myself in readiness to impart instruction whenever called upon, and during the year have addressed the farmers of McLeod county three times and the Olmsted County Horticultural Society once, and extended my travels over the Southern Minnesota road a distance of over 200 miles.

Five hundred and eighty-one miles of my travel has been done on thousand mile tickets and the balance on a pass kindly sent to me by the Chicago, Milwaukee & St. Paul company. I have been obliged to decline two invitations to address popular meetings, but have promised to do so at some future time.

My expenses have been:—

For railroad tickets	$15.48
Looking for seedlings	6.50
Looking up fruit for Pomological meeting	4.50
Expenses of Rochester and Glencoe	3.50
	$29.98

And in addition have given of my time as follows:

Two trips through portions of Houston county	4	days.
In Fillmore county	2	"
Olmsted county	4	"
Winona county	2	"
Martin county	8	"
Looking up fruit for Pomological meeting	8	"
	28	"

Also expenses at St. Paul in working before the Legislature	$12.75
Expenses of June meeting	7.00
	29.98
	$49.73
Payments received	19.75
Balance	$29.98
For 28 days' time	20.02
	$50.00

On motion the bill was referred to the Finance Committee, who reported, recommending that an order be drawn for fifty dollars to pay the account, and the report was on motion adopted.

J. C. Plumb, F. G. Gould and Prof. E. D. Porter, were appointed a committee of award on the premium list.

EVENING SESSION.

Tuesday, January 15.

The society met at the room of the Delta Sigma Society in the University building, and the regular program was proceeded with by the reading of the following paper:

TORNADOES.

By A. W. Sias, of Rochester.

Mr. President, Ladies and Gentlemen :

In the winter of 1879, at the suggestion of Secretary C. Y. Lacy, I prepared a paper on the subject of Irish potatoes. Meeting a member soon after who is an expert in potatoe culture, he remarked, " I heard your article on potatoes, and it seems to me it contained more apples than potatoes."

And now, if any close observer should notice more trees than tornadoes in this crude production, I hope it will be attributed more to the heart than to the head.

I have no sympathy for those sentimental people who charge up all the ills that flesh is heir to to a special act of Divine Providence. I do not believe that the Almighty has any particular grudge against Rochester or Olmsted county, but at the same time I do believe that that part of our State where the greatest neglect of Nature's laws is to be found will prove to be the most unsafe place to live. My orchards, buildings, &c., were damaged to the extent of over $1,000. But if a row of cottonwoods had been set fifteen years ago, four feet apart, directly west of the orchard, it is doubtful whether my loss would be worthy of mention.

Speaking of the damage to the city proper, we are located in the southwestern limits, facing on Cutler street, the most westerly street in the city. Owing to the peculiar location of this street, and the supposed bearing that a judicious use of forest trees has had on the life and property of the settlers directly east of it, I think it well to go a little into the particulars in regard to the planting on this western border of our city. Beginning as far south as Cutler street is worked, or traveled, we find on the east side E. Whitcomb, and on the west our nearest neighbor, M. J. Hoag, both of these gentlemen have, from their earliest settlement on the hill, invested liberally in both fruit and ornamental trees, and escaped almost unharmed. The next place running north is my own, to which I have already alluded, consisting of two blocks, one on each side of the street. Next is the elegant residence of C. C. Willson, Esq., who owns two blocks on either side. His residence is upon the east side, and is completely surrounded with the most lavish supply of deciduous and evergreen trees to be found on any place in the city, if not in the whole county. Three of the best built barns in the county, costing about $3,000, on the west side of the street, and directly west of his residence, just beyond his tree protection, were a total wreck. He said to me that he believed his trees saved his house. The next two blocks on either side are owned by non-residents. The one on the east has but a single tree on it, a small oak. Here the tornado closed in close to the ground and gathered strength to take up many large oaks on the next block east, together with the chimneys. Here it was carried high up by the tall oaks completely over the west block and dashed down on to a brick barn below, doing considerable damage. The next blocks on both side are covered with native trees, and there was little or no damage done in the vicinity. The next two blocks have each a house in the native groves and are all right. Next on the west we come to what was the brick residence of James Bucklin. Here there were no trees for many miles west up the Cascade valley, and his house was a total wreck. Adjoining is the residence of W. E. Kennedy, which is well supplied with trees, his house sustained but little or no damage. Then we cross the Cascade Creek and soon strike the land of Hon. O. P. Whitcomb, who was never known to turn the cold shoulder on an honest tree grower. He owns most of the land up to the railroad, and has it well lined with that noble tree known as Ash Leaved Maple. Am sorry to say that many of these valuable trees went down owing to the fact that there was no protection on the west of them. With the exception of Rev. Geo. Ainsle's residence, which was nicely embowered in trees, and sustained but slight injuries, the balance of the land north to the city limits is owned by non-residents who excuse themselves from planting trees on the ground that tenants will not properly care for them. We would say in justice to these land owners that had they realized the necessity of planting trees as a means of protection to life and property, we believe it would have been promptly and cheerfully done. Non-residents owning large tracts of land destitute of trees, exert an influence on these tornadoes not fully appreciated. Were a man to give me my choice, either to have a 1000 acre tract of land destitute of trees, located southwest of my house and close to it, or allow him to set up a powder magazine near it, I think I should choose the latter. From the aforesaid tract to the worst part of the devastated district, trees were few and far between. Let the *History of Winona and Olmstead County* give the natural result of such neglect:

"On the afternoon of August 21, 1883, the citizens of Rochester and vicinity, observed a peculiar condition of the atmosphere. The air was murky and oppressive. The heavens were overcast by clouds of a dull leaden hue, and apparently there were three strata, but moving in different directions. About three or four o'clock the clouds began to concentrate immediately west of the city, a slight shower of rain passed over, and for a few moments succeeding, the air was still as a tomb. Soon light, fleecy clouds were seen scudding athwart the sky at lightning speed, the great dark mass in the west assumed a greenish cast, the heavens blazed with pale yellow lightning, and soon a roar was heard that caused stern faces to blanch and brave hearts to throb with terror. In a moment the storm was upon us. With a roar like ten thousand demons, it swept down upon the beautiful city. Like a great coiling serpent, darting out a thousand tongues of lightning, with a hiss like the seething roaring Niagara, it wrapped the city in its hideous coils. The crashing of buildings and the despairing shrieks of men, women and children were drowned in its terrible roar. An hour later, the pale moonbeams fell upon two hundred ruined homes, two score of dead, ghastly faces, and the stillness of night was broken by the moans of the wounded and dying. What tongue or pen can half describe this terrible scene of desolation and deaths."

Nature's laws are inexorable, unyielding, and to defy them, or run counter to such laws, shows a weakness, an obstinacy that is open to the highest censure.

The inhabitants of Pompeii who were flourishing in all their glory at the commencement of the Christian era, with a city of 35,000 inhabitants at the foot of Mount Vesuvius, with villas all the way to the top of the volcano, bade defiance to Nature's laws in the choice of location for their beautiful city. And in consequence on the 24th day of August, A.D., 79, they were buried from twenty to seventy feet deep. And in like manner the people of the beautiful city of Rochester, Minnesota, bade defiance to all blizzards and tornadoes, and, at the same time to Nature's laws, when they located near the head of a large, level, open valley that extends many miles west and southwest up the cascade, with scarcely a tree or shrub to break the wind.

Chompallion, the great African traveler, asks: "Is there any crime against Nature which draws down on man a more terrible curse than that of stripping Mother Earth of her sylvan covering? The hand of men has produced this desert and, I verily believe, every other desert upon the surface of this earth. Earth was Eden once; and our misery is the punishment of our sins against the world of plants. The burning sun of the desert is the angel with the flaming sword who stands between us and Paradise."

Seneca says, " It is good for a man to fortify himself on his weak side." And we say that it is wise and expedient for every householder, as well as for every city in the whole land, to fortify itself on its weak side, especially on the west and southwest, from whence came our prevailing winds during the time of these terrible tornadoes.

The late lamented Leonard B. Hodges, the " John A. Warder of this part of the Union," as he has been aptly termed, and Mr. Pearce, another well-known horticulturist, whom we all know how to appreciate, resided for many years near our devastated city. They were both here when I came to the state in '59; and Mr. Hodges was then in the nursery business. Now, let us imagine what might have been the result providing our city fathers, as long ago as '59 had employed one of these noble champions of the "Monarch of the Prairies," the cottonwood, to plant a dozen rows along the western limits of the city, four feet apart each way. Let those who were well-protected by trees at the time of the tornado answer. Right here let me quote from the words of Mr. Hodges, who spoke to us from this very platform less than a year ago, and let us cherish these, the last words to this society, from our acknowledged leader in forestry: " The pioneer farmer out on our oceanic prairies, who surrounds his quarter section, with a broad belt of forest trees, protects not only his own fields and crops from the damaging effects of storms, but to a great extent protects his adjoining neighbor, who, in common with him, enjoys the wealth he has developed, and he can no more prevent them from the enjoyment thereof than from the benefit of sunlight or rainfall, which are the common wealth of all God's creatures. Hence I take the ground that it is not only eminently proper, but that it is the duty of the state, in every suitable way to aid by appropriate legislation in the development or erection of this sort of common wealth. * * * And if I succeed in stirring up the whole legislative menagerie to a realizing sense of their duty in this behalf, I shall feel that I have not lived in vain." He also said at a horticultural meeting at Rochester, in 1878: "The highly refined, fastidious and aristocratic element of our large towns and cities, unite in [despising their noble tree, the cottonwood. But who cares? It has its own merits, merits that will cause it to be propagated, cherished, nourished and protected by willing hands and loving hearts, until the great interior treeless region of the North American continent shall have been reclaimed and become one of the traditions of the past. When the marble monuments vainly erected to perpetuate the memory of the names of its traducers shall have crumbled into dust; when even the State Horticultural Society has ceased to exist, even then will this monumental tree shed its blessings and its cotton alike upon the just and the unjust. I propose to stand by the cottonwood. Whether planted on a sandbank or a river bottom, in the door yard or in a desert, on the prairie or in the timber, the result is a great, sturdy, healthy forest tree. It is a success, and that's why people plant it. It don't fool away years of precious time getting ready to do something, but is up and coming from the word go. It is emphatically a pioneer tree. This and the white willow will do more to prepare the way for the cultivation of fruit trees than any other agencies I can think of."

We measured a cottonwood last month, planted by R. L. Cotterell, of our county, some twenty years ago, that measured nine feet and two inches in circumference. And a tree standing near the Zumbro Falls mill, in the wrecked district, measured fifteen feet and four inches round. Since the tornado passed over this place we have appreciated this and the white willow as never before. We look upon the seeds of the cottonwood as so many harbingers of mercy wafted on pure snowy wings to a needy people.

In speaking of blizzards, simoons, and like winds, Mr. Hodges says: "These elemental forces are undoubtedly all right and play an important part in the economy of nature. We have only to guard against them when on the rampage, and in doing this, forestry is the prime factor, the central figure in the whole business."

We agree with Mr. Hodges and are of the opinion that gales, blizzards, hurricanes, tornadoes and even cyclones are, or should be, important educators, and are also an actual necessity in the economy of nature.

We quote the following from the address made by President Harris at our county horticultural meeting at Rochester last month: "If twenty years since, or even ten, there had been planted and cared for twenty acres of fast growing timber, such as cottonwood and willows, upon every quarter section of land up the Cascade valley, and in addition, trees had been planted about the farm buildings and along the roadsides, that terrible storm would have passed almost harmlessly over the city."

Now let us compare the tornado at Rochester with some others that have occurred in the United States within the present century. In 1860 there was a tornado made up on the Ohio river; it passed up the stream till it had nearly passed New Albany, Indiana, and then struck into the heavy timber north and northeast, and while it made terrible havoc with the timber, but few houses were blown down and few, if any, lives lost. The extent of the wrecked district was about the same as at Rochester. I was in the wake of it within a few days after it occurred. The great September gale of 1815, is still without a parallel in its extraordinary characteristics of violence and destructiveness. The following graphic description is quoted from *The Great Events of the Greatest Century:* "The most calamitous destruction befell the trees, orchards and forests exhibiting a scene of desolation, the like of which has never before been witnessed in America." * * * "Far into the interior the tempest swept and raged with unparalleled fury." * * * "The wind suddenly shifting to the southeast, blew a hurricane, the terrible devastation of which covered a column or area of sixty miles in width." * * * "Fresh water along the seaboard was for a long time, a rarety of price, the wells having generally overflowed and left full of sea water." * * * "When the vast and tremendous tide was sweeping over the land, the spray arising from it was very great over a wide surface of country, extending to the farthermost of the northern states. It is spoken of as having resembled a driving snow storm."

Perhaps if we could form any just conception of the myriads of insects injurious to vegetation, that this baptism of salt water destroyed, we should get a glimpse at one of the benefits of this unparalleled gale.

A NEW VERSION.

Many Bible students have searched the Scriptures in vain for these words: "He tempers the winds to the shorn lamb." Now, my wish is this, that in some distant day, and the day may not be very distant either, when all prejudice shall have been laid aside in regard to our having written from a nurseryman's standpoint or from purely selfish motives, that some faithless shepherd, who perchance has lost dear lambs for want of judicious tree protection, and may be searching the Bible or elsewhere for the comforting words above quoted, may find the only true version ever published to the world in the *Transactions of the Minnesota State Horticultural Society for 1884*, viz., "He tempers the winds to the shorn lambs, only when modified or filtered through the beautiful foliage or spray of our many noble forest trees."

When nature's laws are so far changed that the mariner can safely navigate the broad, trackless ocean without compass, lifeboat or anchor, then, and not till then, will man be safe outside of tree protection.

In conclusion I will say, that in my humble opinion, the cottonwood, *Populus Mamlifera*, is *the tree* of all trees to use for immediate effect against tornadoes, and also the cheapest tree to procure, as the seed and cuttings can be found on most any of our streams or farms, without money and without price. In looking over the devastated district at Rochester I observed this difference between the cottonwood and all other trees, viz: in the case of fruit trees, evergreens etc., the tornado invariably took the largest specimens, while near the Zumbro Falls Mill, where it struck fearfully hard, the large cottonwood alluded to above as measuring over fifteen feet, had no damage done to it except a few limbs broken from the top, and another in the north line of the tornado measured nineteen and one-half feet in circumference. While many cottonwoods of medium size and the largest specimens of other varieties were laid low by this terrible gale, these "Monarchs of the Forest" stood apparently as firm as the everlasting hills, while many of the fine marble tombstones, just beyond in Oakwood Cemetery, were leveled to the dust. When I shall have planted my last tree, and have resigned my spade, as I hope, to more faithful hands, who will be able to do more to save our people from tornadoes, I will crave no prouder monument to mark my last resting place than one of these despised "Monarchs of the Forest."

Discussion on the paper of Mr. Sias was postponed till to-morrow morning, in order to introduce the next paper on

THE WILD FLOWERS OF LAKE PEPIN VALLEY.

By Miss Sara Manning, of Lake City, Minnesota.

INTRODUCTION BY THE SECRETARY.

[*Mr. President, Ladies and Gentlemen:* Before the reading of this paper is proceeded with, I desire to say that it has been written for the State Horticultural Society by particular request, and the object in view in asking Miss Manning to furnish it at this time was to make a commencement of a record of the wild flowers and ferns of Minnesota, in our annual report for the year 1884, in the hope that other botanists, after reading this paper, may supply any omissions in it, of varieties they may find anywhere in this State, so that in time we may have in the reports of this society a complete botanical survey of Minnesota in this department. Its interest and value to botanists and horticulturists will be apparent without any remark of mine.

I also wish to say that, while Miss Manning, in order to bring her paper within the usual limits, has very properly omitted the botanical names of most of the varieties, she has kindly offered to furnish a catalogue, and it will be printed in connection with the paper, for reference.]

Miss Manning then read her paper as follows:

During the walks and drives of two pleasant seasons, I have studied the wild flowers of our beautiful valley. Without attempting a scientific arrangement, some idea of them may be given, though not nearly all can receive even a passing notice.

No doubt it would be more proper to consider them by families, but I have chosen to divide the valley, which lies partly in Wisconsin and partly in Minnesota, into several regions and mention the flowers of each without regard to their relationships.

It is a consoling thought to those interested in botany that many of our precipitous bluff-sides and deep ravines can never be cultivated. Here many flowers and ferns will be allowed to grow unmolested by the "westward march of civilization," before which many prairie species disappear.

The more delicate species grow on these bluff-sides, which have a northern exposure. Just at their base in early spring the Purple Anemone blossoms, a daring little pioneer that comes even while here and there the snow still lingers. It is shielded by a furry involucre and blossoms close to the ground, but afterwards grows taller and is surrounded by the leaves which did not at first appear. Soon after, up the sides, we find the Blood-root wrapped in its sheltering leaf, the Hepatica, forcing its delicate tinted blossoms through last year's fallen leaves; Wind-flower, Rue-Anemone, Baneberry, with graceful Columbine and Feathery Meadow-Rue growing about rocks and roots of trees. Quite a rare species of Virgin's-Bower (Clematis verticillaris) climbs over shrubs and small trees, hanging purple bells from their branches. Beautiful pink-tipped Dicentra, white Wake-Robin, which soon changes to rose-color, and Canada Violet are among early flowers.

Later, Two-leaved Solomon's Seal and Mitrewort send up little white blossoms from their bed of moss. Beneath two soft velvety leaves, the queer red-brown flower of Wild Ginger hangs its head. In moist places are Blue Cohosh, Mandrake, and Wild Sarsaparilla, and here Jack-in-the-Pulpit preaches a silent sermon. Farther up are fern-like sprays of False Solomon's Seal and Bellwort, its drooping flower of pale yellow, half hidden by the leaves. In some little nooks the ground is carpeted with the shining leaves of Wintergreen, one species (Pyrola secunda) with its one-sided racemes, reminding us of the Lily of the Valley. Very common is the Large Yellow Lady's Slipper and Calopogon, sometimes called Grass Pink because of its grass-like leaves. In a few places is the Showy Lady's Slipper, most beautiful of the genus, having two, sometimes three, flowers on a stem. Last of all are Five-flowered and Fringed Gentians which open their blue blossoms late in October; with them is that strange species which always remains closed.

To ferns and mosses more than to flowers the bluff-sides owe their beauty. Trailing over fallen tree trunks and draping rough rocks with green luxuriance as though nature were trying to cover all unsightly objects with lovely living forms. The little rock-loving brake (Pellæa atropurpurea) with dark green fronds in contrast with the brown stems completely covers the shaded side of rocks. More delicate (Pellæa gracilis) with fronds of lighter green grows on mossy ledges, in the crevices of which Walking Leaf is occasionally found. On the ground the long slender fronds of Cystopteris tangle themselves with everything near, and the beautiful Maidenhair grows in all possible places. Then there are the Shield Ferns and tall Spleenworts, with here and there a Moonwort Fern.

At the summit of the bluffs the little evergreen Polypodys stand erect among the moss.

With the mixed undergrowth at the top of the bluffs are Ostrich Ferns Common Brake and Flowering Ferns. Contrasting with their dark green fronds are the bright flowers of Wild Phlox, Greek Valerian, Red Lily and Painted Cup, with brilliant bracts, which make it the most showy of our wild flowers.

All down the sunny southern slopes are mats of Rock Cress, Long-flowered Puccoon, Spiderwort, in many shades of purple and blue, Zygedene, with wax-like flowers, and sprays of dainty little Harebell. Many of the prairie flowers grow also on these southern slopes.

Down in some cool, shaded ravines between the bluffs, wild vines grow unchecked. Bittersweet, Woodbine and glossy-leaved Greenbrier climb the trees and hang festoons from their branches, Poison Ivy clings by its rootlets to the rocks, Pipe Vine covers shrubs with its broad leaves and bright flowers, and slender Wild Yam twines about the bushes. Here, also, are Cornell, Arrow-wood, Mountain Maple, Strawberry Bush, Honeysuckle and many other beautiful shrubs.

Out in the oak barrens the Rose Family is well represented by its Strawberries, Cinquefoils, Spireas, Avens, Brambles and Wild Roses. With them are four species of blue Violets, Wild Geranium, Wood Sorrel, Cleavers, Polygalas, Starry Campion, etc. A common shrub is Jersey Tea, with clusters of small white flowers, the petals of which are shaped like tiny soup-ladles. The Mustard, Parsley Figwort and Mint Families add many species to the flowers of the oak wood. Where they border the shores of the lake, the trees are in many places covered with the thick foliage of Wild Grape and Moonseed. On the banks are Milk Vetch, Wild Licorice, False Indigo and other species common to river banks.

The Pulse and Composite Families are especially characteristic of the prairie. To the former belong Wild Beans, Lupines, Vetches, Clovers, etc. Two especially pretty plants of this family are (Amorpha canescens) which has rich dark purple petals and golden excerted stamens, and (Petalostemon villosus) with rose-colored flowers. Of the Composite Family the number is legion. Through the late summer and autumn, our prairies are brilliant with a bewildering array of Sunflowers, Cone-flowers, Blazing-Stars, Fleabanes, Golden-rods, Asters, etc. To this family belongs the odd Compass Plant, which might be very convenient as its leaves point north and south. Tall Azure Larkspur, Puccoon, Butterfly Weed, Flowering Spurge, and Oxybaphus, which like its relative the garden Four-o'clock closes in the sunshine, are common prairie species. On the sandy soil of the Wisconsin side, Dwarf Wild Rose covers whole hill-sides, making a beautiful sight in the time of flowers and filling the air with fragrance. An especially conspicuous plant of that side is Peutstemon grandiflorus with its light green leaves and long racemes of bright pink flowers.

Though each side of Lake Pepin has many species not found on the other, in using only common names it is difficult to make distinctions.

Wayside weeds we have without number, which though scornfully called homely weeds, are often very interesting to study.

As we follow the windings of a little creek, where in the springtime Yellow Violets and pale pink Waterleaf grew, and the banks were golden with Buttercups and Cowslips, we find it fringed with a tangled growth. Virgin's-Bower trims trees and shrubs with its white blossoms, Bineweed and Wild Cucumber tangle their long vines with tall Touch-me-not, Indian Hemp and Swamp Milkweed. In grassy places Solomon's Seal swings its row of tiny bells over the water. Green striped Grass of Parnassus and Purple Polygala grow near. Ellisea trails its minute flowers and pretty leaves on the ground. On the wet banks are blue spikes of Tall Bellflower and Great Lobelia. Floating upon the water where it flows softly are green leaves and yellow blossoms of Monkey-flower (Mimulus Jamesii).

Where the creek flows into a pond are crimson and rose-colored spikes of Water Smartweed, White Water Lilies with floating leaves, and Yellow with leaves erect. In bordering marshes is a a miscellaneous mixture of Blue Flags, Cat-tails, Arrow-heads, Water-Plantain, etc. The most showy marsh plants are Pickerelweed, which has spikes of violet flowers, and Cardinal Lobelia.

The little white and yellow Lady's Slippers are sometimes found in bogs, though both are rare.

Though this essay seems a general tangle of flowers and vines, there are many species, some of them little favorites, and even whole families, for which there is no room. The catalogue to be printed with it contains about five hundred Phænogamous plants and ferns found in the Valley of Lake Pepin. Some one learned in wildflower lore might give a more complete list. The knowledge of these and an herbarium containing half the number are results of last summer's study.

It is sometimes a surprise that Botany is not more studied, not only because of its intimate relation to Horticulture, but also for the pleasure it affords. No other science can be so easily studied, and none with more pleasing results. It is interesting in all seasons—from early spring, when in our first walks we find the tiny ferns unrolling and tender leaves just breaking through the sod; through the summer, with its wealth of bright blossoms; to the autumn, when there is much to learn of fruit and seeds. Even in the snow-bound days of winter we may study the arrangement of branches on different shrubs and trees. Then more than ever each tree seems to have an individual character, as we see it outlined against the sky, stripped of its summer foliage.

Leave dry text-books and go out and see "*How Plants Behave.*" Almost unconsciously too, we find ourselves studying Entomology and wondering why particular species are always visited by certain insects. By careful watching we may learn their secrets.

It is a restful, helpful study, making every-day life brighter. One need never be lonely out among the flowers where the bright-winged insects come and go, where on all sides—

> "Whether we look or whether we listen,
> We hear life murmur or see it glisten."

CATALOGUE.

RANUNCULACEÆ.

(CROWFOOT FAMILY.)

Clematis

1. verticillaris, DC.; *Virgin's Bower.*
2. Virginiana, L.; *Common Virgin's Bower.*

Anemone

3. patens, L.; *Pasque-flower.*
4. cylindrica, Gray; *Long-fruited Anemone.*
5. Virginiana, L.; *Virginian Anemone.*
6. Pennsylvanica, L.; *Pennsylvanica Anemone.*
7. nemorosa, L.; *Wind-flower.*

Hepatica

8. triloba, Chaix.; *Round-lobed Hepatica.*
9. acutiloba, DC.; *Acute-lobed Hepatica.*

Thalictrum

10. anemonoides, Michx.; *Rue Anemone.*
11. dioicum, L., *Early Meadow Rue.*
12. purpurascens, L.; *Purplish Meadow Rue.*
13. Cornuti, L.; *Tall Meadow Rue.*

Ranunculus

14. rhomboideus, Goldie; *Early Crowfoot.*
15. abortivus, L.; *Small-flowered Crowfoot.*
16. sceleratus, L.; *Cursed Crowfoot.*
17. recurvatus, Poir.; *Hooked Crowfoot:*
18. Pennsylvanicus, L.; *Bristly Crowfoot.*
19. *acris*, L.; *Buttercups.*

Caltha

20. palustris, L.; *Marsh Marigold*, *Cowslip.*

Aquilegia

21. Canadensis, L.; *Wild Columbine.*

Delphinium

22. azureum, Michx.; *Azure Larkspur.*

Actæa

23. spicata, L., var. rubra, Mx.; *Red Baneberry.*
24. alba, Bigel.; *White Baneberry.*

MENISPERMACEÆ.

(MOONSEED FAMILY.)

Menispermum

25. Canadense, L., *Moonseed.*

BERBERIDACEÆ.

(BARBERRY FAMILY.)

Caulophyllum

26. thalictroides, Michx.; *Blue Cohosh.*

Podophyllum

27. peltatum, L.; *Mandrake, May Apple.*

NYMPHÆACEÆ.

(WATER-LILY FAMILY.)

Nymphæa

28. tuberosa, Paine; *White Water-Lily.*

Nuphar

29. advena, Aiton; *Yellow Pond-Lily.*

PAPAVERACEÆ.

(POPPY FAMILY.)

Sanguinaria

30. Canadensis, L.; *Blood-root.*

FUMARIACEÆ.

(FUMATORY FAMILY.)

Dicentra

31. Cucullaria, DC.; *Dutchman's Breeches.*

Corydalis

32. aurea, Willd.; *Golden Corydalis.*

CRUCIFERÆ.

(MUSTARD FAMILY.)

Nasturtium

33. *officinale*, R. Br.; *True Water Cress.*
34. sinuatum, Nutt.; *Water Cress.*

Cardamine

35. hirsuta, L.; *Small Bitter Cress.*

Arabis

36. lyrata, L.; *Rock Cress.*
37. lævigata, DC.; *Smooth Rock Cress.*
38. Canadensis, L.; *Sickle-pod.*
39. perfoliata, Lam.; *Tower Mustard.*

Erysimum

40. cheiranthoides, L.; *Worm-seed Mustard.*

Sisymbrium

41. *officinale*, Scop.; *Hedge Mustard.*

Brassica

42. *alba*, Gray; *White Mustard.*
43. *nigra*, Gray; *Black Mustard.*

Draba

44. Caroliniana, Walt.; *Whitlow Grass.*

Alyssum

45. *calycinum*, L.; *Alyssum.*

Capsella

46. *Bursa-pastoris*, Mœnch.; *Shepherd's Purse.*

Lepidium

47. Virginicum, L.; *Wild Peppergrass.*

CAPPARIDACEÆ.

(CAPER FAMILY.)

Polanisia

48. graveolens, Raf.; *Polanisia.*

VIOLACEAE.

(VIOLET FAMILY.)

Viola

49. **cucullata, Aiton; *Common Blue Violet.***
50. cucullata, Ait., var. palmata, Gr.; *Hand-leaf Violet.*
51. sagittata, Aiton; *Arrow-leaved Violet.*
52. delphinifolia, Nutt; *Larkspur Violet.*
53. pedata, L.; *Bird-foot Violet.*
54. canina, L., var. sylvestris, Reg.; *Dog Violet.*
55. Canadensis, L.; *Canada Violet.*
56. pubescens, Ait.; *Downy Yellow Violet.*

CISTACEÆ.

(ROCK-ROSE FAMILY.)

Helianthemum

57. Canadense, Michx.; *Frost-weed.*

Hudsonia

58. ericoides, L.; *Hudsonia.*

HYPERICACEÆ.

(ST. JOHN'S-WORT FAMILY.)

Hypericum

59. corymbosum, Muhl.; *St. John's-wort.*
60. mutilum, L.; *Slender St. John's-wort.*
61. pyramidatum, Ait.: *Great St. John's-wort.*

CARYOPHYLLACEÆ.

(PINK FAMILY.)

Saponaria

62. *officinalis*, L.; *Common Soapwort.*
63. *vulgaris*, Host.; *Cow Herb.*

Silene

64. stellata, Ait.; *Starry Campion.*
65. antirrhina, L.; *Sleepy Catchfly.*
66. *noctiflora*, L,; *Night-flowering Catchfly.*

Lychins

67. *Githago*, Lam.; *Corn Cockle.*

Cerastium

68. *vulgatum*, L.; *Mouse-ear Chickweed.*

Mollugo

69. verticillata, L.; *Carpet-weed.*

MALVACEÆ.

(MALLOW FAMILY.)

Malva

70. *rotundifolia*, L.; *Common Mallow.*
71. *sylvestris*, L.; *High Mallow.*
72. *crispa*, Gray; *Curled Mallow.*

Abutilon

73. *Avicennæ* Gærtri.; *Velvet Leaf.*

TILIACEÆ.

(LINDEN FAMILY.)

Tilia

74. Americana, L.; *Linden, Basswood.*

LINACEÆ.

(FLAX FAMILY.)

Linum

75. sulcatum, Riddell; *Wild Flax.*

GERANIACEÆ.

(GERANIUM FAMILY.)

Geranium

76. maculatum, L.; *Wild Cranesbill.*

Impatiens

77. pallida, Nutt; *Pale Touch-me-not.*
78. fulva, Nutt; *Spotted Touch-me-not.*

Oxalis

79. violacea, L.; *Violet Wood-Sorrel.*
80. stricta, L.; *Yellow Wood-Sorrel.*

RUTACEÆ.

(RUE FAMILY.)

Zanthoxylum

81. Americanum, Mill.; *Prickly Ash.*

ANACARDIACEÆ.

(CASHEW FAMILY.)

Rhus

82. glabra, L.; *Smooth Sumach.*
83. copallina, L.; *Dwarf Sumach.*
84. Toxicodendron, L.; *Poison Ivy.*

VITACEÆ.

(VINE FAMILY.)

Vitis

85. Labrusca, L.; *Northern Fox-Grape.*
86. cordifolia, Michx.; *Frost Grape.*

Ampelopsis

87. quinquefolia, Michx.; *Virginian Creeper.*

RHAMNACEÆ.

(BUCKTHORN FAMILY.)

Ceanothus

88. Americanus, L.; *New Jersey Tea.*

CELASTRACEÆ.

(STAFF-TREE FAMILY.)

Celastrus

89. scandens, L.; *Climbing Bitter-sweet.*

Euonymus

90. Americanus, L.; *Strawberry Bush.*

SAPINDACEÆ.

(SOAPBERRY FAMILY.)

Staphylea

91. trifolia, L.; *American Bladder-nut.*

Acre

92. Pennsylvanicum, L.; *Striped Maple.*
93. spicatum, Lam.; *Mountain Maple.*
94. saccharinum, Wang.; *Sugar or Rock Maple.*
95. dasycarpum, Ehrhart; *Silver Maple.*

Negundo

96. aceroides, Mœnch.; *Ash-leaved Maple.*

POLYGALACEÆ.

(MILKWORT FAMILY.)

Polygala

97. polygama, Walt.; *Polygala.*
98. sanguinea, L.; *Purple Polygala.*
99. Senega, L.; *Seneca Snakeroot.*

LEGUMINOSÆ.

(PULSE FAMILY.)

Lupinus

100. perennis, L.; *Wild Lupine.*

Trifolium

101. *pratense*, L.; *Red Clover.*
102. repense, L.; *White Clover.*
103. *procumbens* L.; *Low Hop-Clover.*

Melilotus

104. *alba*, Lam.; *Sweet Clover.*

Petalostemon

105. violaceus, Michx.; *Prairie Clover.*
106. candidus, Michx.; *Prairie Clover.*
107. villosus, Nutt.; *Prairie Clover.*

Amorpha

108. fruticosa, L.; *False Indigo.*
109· canescens, Nutt.; *Lead-Plant.*

Astragalus

110. Canadensis, L.; *Milk-Vetch.*
111. Cooperi, Gray; *Milk-Vetch.*

Glycyrrhiza

112. lepidota, Nutt.; *Wild Licorice.*

Desmodium

113. acuminatum, DC.; *Tick-Trefoil.*
114. Canadense, DC.; *Tick-Trefoil.*
115. canescens, DC.; *Tick-Trefoil.*

Lespedeza

116. hirta, Ell.; *Bush Clover.*

Vicia

117. sativa, L.; *Common Vetch.*
118. Caroliniana, Walt.; *Pale Vetch.*
119. Americana, Muhl.; *Purple Vetch.*

Lathyrus

120. venosus, Muhl.; *Vetchling.*
121. ochroleucus, Hook.; *Indian Pea.*

Phaseolus

122. pauciflorus, Benth.; *Kidney Bean.*

Baptisia

123. villosus, Ell.; *Wild Indigo.*
124. leucantha, Torr. & Gr.; *Wild Indigo.*
125. leucophæa, Nutt.; *Wild Indigo.*

Cassia

126. Chamæcrista, L.; *Partridge Pea.*

ROSACEÆ.

(ROSE FAMILY.)

Prunus

127. Americana, Marshall; *Wild Plum.*
128. pumila, L.; *Dwarf Cherry.*
129. Virginiana, L.; *Choke-Cherry.*
130. serotina, Ehrh.; *Wild Black Cherry.*

Spiræa

131. opulifolia, L.; *Nine Bark.*
132. salicfolia, L.; *Common Meadow Sweet.*

Agrimonia

133. Eupatoria, L.; *Common Agrimony.*

Geum

134. album, Gmelin; *White Geum.*
135. strictum, Aiton; *Avens.*
136. rivale, L.; *Purple Avens.*

Potentilla

137. Norvegica, L.; *Cinquefoil.*
138. paradoxa, Nutt.; *Cinquefoil.*
139. Canadensis, L.; *Common Cinquefoil.*
140. Canadensis, L., var. simplex, T. & Gr.; *Cinquefoil.*
141. arguta, Pursh.; *Stout Cinquefoil.*

Fragaria

142 Virginiana, Ehrh.; *Wild Strawberry.*
143. Vesca, L.; *Wild Strawberry.*

Rubus

144. triflorus, Richardson; *Dwarf Raspberry.*
145. strigosus, Michx.; *Wild Red Raspberry.*
146. occidentalis, L.; *Black Raspberry.*
147. villosus, Aiton; *High Blackberry.*
148. Canadensis, L.; *Low Blackberry.*

Rosa

149.lucida, Ehrh.; *Dwarf Wild-Rose.*

Cratægus

150. tomentosa, L.; *Black or Pear Thorn.*
151. Crus-galli, L.; *Cockspur Thorn.*

Pyrus

152. coronaria, L.; *American Crab Apple.*
153. arbutifolia, L.; *Choke-berry.*

Amelanchier

154. Canadensis, T. & Gr., var. Botryapium, Gr.; *June-berry.*

SAXIFRAGACEÆ.

(Saxifrage Family.)

Ribes

155. Cynosbati, L.; *Wild Gooseberry.*
156. floridum, L.; *Wild Black Currant.*

Parnassia

157. Caroliniana, Michx.; *Grass of Parnassus.*

Saxifraga

158. Pennsylvanica, L.; *Swamp Saxifrage.*

Heuchera

159. Americana, L., *Common Alum-root.*

Mitella

160. diphylla, L.; *Mitrewort.*

CRASSULACEÆ.

(ORPINE FAMILY.)

Penthorum

161. sedoides, L., *Ditch Stone-crop.*

ONAGRACEÆ.

(EVENING PRIMROSE FAMILY.)

Circeæa

162 Lutetiana, L.; *Enchanter's Nightshade.*

Gaura

163. biennis, L.; *Gaura.*

Epilobium

164 coloratum, Muhl.; *Willow-herb.*

Œnothera

165. biennis, L.; *Common Evening Primrose.*
166. rhombipetala, Nutt.; *Evening Primrose.*

Ludwigia

167. polycarpa, short & Peter; *False Loosestrife.*

LYTHRACEÆ.

(LOOSESTRIFE FAMILY.)

Lythrum

168. alatum, Pursh.; *Loosestrife.*

CUCURBITACEÆ.

(GOURD FAMILY.)

Sicyos

169. angulatus, L.; *One-seeded Star Cucumber.*

UMBELLIFERÆ.

(PARSLEY FAMILY.)

Sanicula

170. Marilandica, L., *Sanicle.*

Eryngium

171. yuccæfolium, Michx.; *Rattlesnake Muster.*

Daucus

172. *Carota*, L.; *Common Carrot.*

Heracleum

173. lanatum, Michx.; *Cow-Parsnip.*

Pastinaca

174. *sativa*, L ; *Common Parsnip.*

Archangelica

175. hirsuta, Torr & Gray; *Archangelica.*
176 atropurpurea, Hoffin.; *Great Angelica.*

Æthusa

177. *Eynapium*, L.; *Fool's Parsley.*

Thaspium

178. aureum, Nutt.; *Meadow-Parsnip.*
179. trifoliatum, Gray; *Meadow Parsnip.*

Zizia

180. integerrima, DC.; *Zizia.*

Cicuta

181. maculata, L.; *Water-Hemlock.*

Sium

182. lineare, Michx.; *Water-Parsnip.*

Cryptotaenia

183. Canadensis, DC.; *Honewort.*

Osmorrhiza

184. longistylis, DC.; *Smoother Sweet-Cicely.*
185. brevistylis, DC.; *Hairy Sweet-Cicely.*

ARALIACEÆ.

(Ginseng Family.)

Aralia

186. racemosa, L.; *Spikenard.*
187. nudicaulis, L.; *Wild Sarsaparilla.*
188. trifolia, Gray; *Dwarf Ginseng.*

CORNACEÆ.

(Dogwood Family.)

Cornus

189. Canadensis, L.; *Dwarf Cornell.*

190. sericea, L.; *Silky Cornell, Kinnikinnick.*
191. stolonifera, Michx.; *Red-osier Dogwood.*

CAPRIFOLIACEÆ.

(HONEYSUCKLE FAMILY.)

Symphoricarpus

192. racemosus, Michx.; *Snowberry.*
193. racemosus, Mx., var. pauciflorus, Robb.; *Snowberry.*
194. vulgaris, Michx.; *Indian Currant.*

Lonicera

195. grata, Ait.; *American Woodbine.*
196. parviflora, Lam.; *Small Honeysuckle.*

Diervilla

197. trifida, Mœnch.; *Bush Honeysuckle.*

Triostemon

198. perfoliatum, L.; *Fever-wort.*

Sambucus

199. Canadensis, L.; *Common Elder.*

Viburnum

200. dentatum, L.; *Arrow-wood.*
201. Opulus, L.; *Cranberry-tree.*

RUBIACEÆ.

(MADDER FAMILY.)

Galium

202. trifidum, L.; *Small Bedstraw.*
203. triflorum. Michx.; *Sweet-scented Bedstraw.*
204. boreale, L.; *Northern Bedstraw.*

Houstonia

205. purpurea, L., var. longifolia, Gr.; *Houstonia.*

VALERIANACEÆ.

(VALERIAN FAMILY.)

Valeriana

206. edulis, Nutt.; *Valerian.*

Fedia

207. Fagopyrum, T. & Gray.; *Lamb Lettuce.*

DIPSACEÆ.

(TEASEL FAMILY.)

Dipsacus

208. sylvestris, Mill.; *Wild Teasel.*

COMPOSITÆ.

(COMPOSITE FAMILY.)

Vernonia

209. fasciculata, Michx.; *Iron Weed.*

Liatris

210. squarrosa, Willd.; *Blazing-star.*
211. cylindracea, Michx.; *Blazing-star.*
212. spicata, Willd.; *Blazing-star.*
213. pycnostachya, Michx.; *Blazing-star.*

Eupatorium

214. ageratoides, L.; *White Snake-root.*
215. perfoliatum, L.; *Thoroughwort.*
216. purpureum, L.; *Joe-Pye Weed.*

Tussilago

217. *Farfara, L.: Coltsfoot.*

Aster

218. cordifolius, L.; *Heart-leaved Aster.*
229. dumnosus, L.; *Aster.*
220. multiflorus, Ait; *Many-flowered Aster.*
221. Novæ-Anglia, L.; *New England Aster.*
222. ptarmicoides, T. & Gr.; *Aster.*
223. sagittifolius, Willd.; *Arrow-leaved Aster.*
224. sericeus, Vent.; *Silky Aster.*
225. simplex, Willd.; *Pale Aster.*
226. Tradescanti, L.; *Aster.*

Erigeron

227. bellidfolium, Muhl.; *Robin's Plantain.*
228. Philadelphicum, L.; *Common Fleabane.*
229. annuum, Pers.; *Daisy Fleabane.*

Diplopappus

230. umbellatus, Torr. & Gray.; *Double-bristled Aster.*

Boltonia

231. glastifolia, L'Her.; *Boltonia.*

Solidago

232. cæsia, L.; *Golden-rod.*
233. lanceolata, L.; *Golden-rod,*
234. latifolia, L.; *Golden-rod.*
235. nemoralis, Ait.; *Golden-rod.*
236. speciosa, Nutt.; *Golden rod.*
237. serotina, Ait.; *Golden-rod.*
238. stricta, Ait.; *Golden-rod*

Silphium

239. laciniatum, L.; *Rosin-weed, Compass Plant.*
240. perfoliatum, L.; *Cup Plant.*

Iva

241. xanthiifolia, Nutt.; *Marsh Elder.*

Ambrosia

242. trifida, L.; *Great Ragweed.*
243. artemisiæfolia, L.; *Roman Wormwood..*

Xanthium

244. strumarium, L.; *Common Cocklebur.*

Rudbeckia

245. hirta, L.; *Cone-flower.*
246. laciniata,; *Cone-flower.*

Helianthus

247. *annuns*, L.; *Common Sunflower.*
248. giganteus, L.; *Sunflower.*
249. grosse-serratus, Martins.; *Sunflower.*
250. occidentalis, Riddell.; *Sunflower.*
251. rigidus, Desf.; *Sunflower.*
252. strumosus, L.; *Sunflower.*
253. tracheliifolius, Willd.; *Sunflower.*

Coreopsis

254. palmata, Nutt.; *Tickseed.*

Bidens

255. frondosa, L.; *Common Beggar-ticks.*
256. cernua, L.; *Smaller Bur-Marigold.*

Helenium

257. autumnale, L ; *Sneeze-weed.*

Maruta

258. *Cotula*, DC.; *May-weed.*

Achillea

259. Millefolium, L.; *Common Yarrow.*

Tanacetum

260. *vulgare,* L.; *Tansy.*

Artemisia

261. caudata, Michx.; *Wormwood.*
262. Ludoviciana, Nutt.; *Western Mugwort.*
263. frigida, Willd.; *Wormwood.*

Gnaphalium

264. polycephalum, Michx.; *Common Everlasting.*

Antennaria

265. plantaginfolia, Hook.; *Plantain-leaved Everlasting.*

Erechthites

266. hieracifolia, Raf.; *Fireweed.*

Cacalia

267. reniforms, Muhl.; *Great Indian Plantain.*

Senecio

268. palustris, Hook.; *Groundsell.*
269. aureus, L.; *Golden Ragwort.*

Cirsium

270. *lanceolatum,* Scop.; *Common Thistle.*
271. altissimum, Spreng.; *Tall Thistle.*
272. muticum, Michx.; *Swamp Thistle*

Lappa

273. *officinalis,* Allioni.; *Burdock.*

Cynthia

274. Virginica, Don.; *Cynthia.*

Troximon

275. cuspidatum, Pursh.; *Troximon.*

Hieracium

276. Canadense, Michx.; *Canada Hawkweed.*

Nabalus

277. albus, Hook.; *White Lettuce.*

Taraxacum

278. Dens-leonis, Desf.; *Dandelion.*

Lactuca

279. Canadensis, L; *Wild Lettuce.*

Sonchus

280. *asper*, Vill.; *Spiny-leaved Sow-Thistle*

LOBELIACEÆ.

(LOBELIA FAMILY.)

Lobelia

281. cardinalis, L.; *Cradinal-flower.*
282. syphilitica, L.; *Great Lobelia.*
283. spicata, Lam.; *Lobelia.*

CAMPÁNULACEÆ.

(CAMPANULA FAMILY.)

Campanula

284. rotundifolia, L.; *Harebell.*
285. Americana, L.; *Tall Bellflower.*

ERICACEÆ.

(HEATH FAMILY.)

Vaccinium

286. Pennsylvanicum, Lam.; *Dwarf Blueberry.*

Arctostaphylos

287. Uva-ursi, Spreng.; *Bearberry.*

Gaultheria

288. procumbens, L ; *Creeping Wintergreen.*

Pyrola

289. elliptica, Nutt.; *Shin-leaf.*
290. secunda, L.; *Wintergreen,*

Chimaphila

291. umbellata, Nutt.; *Prince's Pine*

AQUIFOLIACEÆ.

(HOLLY FAMILY,)

Ilex

292. verticillata, Gray.; *Black Alder.*

Nemopanthes

293. Canadensis, DC.; *Mountain Holly.*

PLANTAGINACEÆ.

(PLANTAIN FAMILY.)

Plantago

294. major, L.; *Common Plantain.*

PRIMULACEÆ.

(PRIMROSE FAMILY.)

Lysimachia

295. stricta, Ait.; *Loosestrife.*
296. ciliata, L.; *Loosestrife.*

LENTIBULACEÆ.

(BLADDERWORT FAMILY.)

Utricularia

297. vulgaris, L.; *Common Bladderwort.*

OROBANCHACEÆ.

(BROOM-RAPE FAMILY.)

Aphyllon

298. uniflorum, T. &. Gr.; *One-flowered Cancer-root.*

SCROPNULARIACEÆ.

(FIGWORT FAMILY.)

Verbascum

299. *Thapsus,* L.; *Common Mullein.*
300. *Blattaria,* L.; *Moth Mullein.*

Linaria

301. *vulgaris,* Miller; *Toad-Flax.*

Scrophularia

302. nodosa, L.; *Figwort.*

Pentstemon

303. grandiflorus, Fraser; *Beard-tongue.*

Mimulus

304. ringens, L.; *Monkey-flower.*
305. Jamesii, Torr.; *Monkey-flower.*

Gratiola

306. Virginiana, L.; *Hedge-Hyssop.*

Veronica

307. Virginica, L.; *Culver's-root.*
308. Americana, Schwein; *American Brooklime.*

Gerardia

309. purpurea, L.; *Purple Gerardia.*
310. aspera, Dougl.; *Gerardia.*
311. pedicularia, L.; *Gerardia.*

Castilleia

312. coccinea, Spreng.; *Scarlet Painted-Cup.*
313. sessiliflora, Pursh.; *Painted-Cup.*

Pedicularis

314. Canadensis, L.; *Common Lousewort.*

VERBENACEÆ.

(VERVAIN FAMILY.)

Verbena

315. angustifolia, Michx.; *Vervain.*
316. hastata, L.; *Blue Vervain.*
317. urticifolia, L.; *White Vervain.*
318. stricta, Vent.; *Hoary Vervain.*
319. bracteosa, Michx.; *Vervain.*

Phyrma

320. Leptostachya, L; *Lopseed.*

LABIATÆ.

(MINT FAMILY.)

Teucrium

321. Canadense, L.; *Wood Sage.*

Mentha

322. Canadensis, L.; *Wild Mint.*

Lycopus

323. Virginicus, L.; *Bugle-weed.*
324. • Europæus, L.; var sinuatus, Gr.; *Water Horehound.*

Pycnanthemum

325. lanceolatum, Pursh.; *Mountain Mint.*

Hedeoma

326. pulegioides, Peus., *American Pennyroyal.*
327. hispida, Pursh.: *Mock Pennyroyal.*

Monarda

328. fistulosa, L.; *Wild Bergamot.*
329. punctata, L.; *Horse-Mint.*

Lophanthus

330. scrophulariæfolius, Benth.; *Giant Hyssop.*

Nepeta

331. *Cataria*, L.; *Catnip.*
332. *Glechoma*, Benth.; *Ground Ivy.*

Physostegia

333. Virginiana, Benth.; *False Dragon-head.*

Scutellaria

334. parvula Michx.; *Scullcap.*
335. galericulata, L.; *Scullcap.*
336. lateriflora, L.; *Mad-dog Scullcap.*

Stachys

337. palustris, L ; *Hedge-Nettle.*

Leonurus

338. *Cardiaca*, L.; *Motherwort.*

BORRAGINACEÆ.

(BORAGE FAMILY.)

Lithospermum

339. hirtum, Lehm.; *Hairy Puccoon.*
340. canescens, Lehm.; *Hoary Puccoon.*
341. longiflorum, Spreng.; *Long-flowered Puccoon.*

Echinospermum

342. *Lappula*, Lehm.; *Stickseed.*
343. Redowskii, Lehm.; *Stickseed.*

Cynoglossum

344. *officinale*, L ; *Hounds-Tongue.*

HYDROPHYLLACEÆ.

(WATERLEAF FAMILY.)

Hydrophyllum

345. Virginicum. L ; *Waterleaf.*

Ellisia

346. Nyctelea, L.; *Ellisia.*

POLEMONIACEÆ.

(POLEMONIUM FAMILY.)

Polemonium

347. reptans, L.; *Greek Valerian.*

Phlox

348. divaricata, L.; *Phlox.*
349. pilosa, L.; *Phlox.*

CONVOLVULACEÆ.

(CONVOLVULUS FAMILY.)

Calystegia

350. sepium, R. Br.; *Hedge Bineweed.*
351. spithamæa, Pursh.; *Bracted Bineweed.*

Cuscuta

352. Gronovii, Willd.; *Dodder.*
353. glomerata, Chois.; *Dodder.*

SOLANACEÆ.

(NIGHTSHADE FAMILY.)

Solanum

354. *nigrum,* L.. *Common Nightshade.*

Physalis

355. Philadelphica, Lam.; *Ground Cherry.*
356. viscosa, L.; *Ground Cherry.*
357. Pennsylvanica, L., var. lanceolata, Gr.; *Ground Cherry.*

Datura

358. *Tatula,* L.; *Purple Thorn-Apple.*

GENTIANACEÆ.

(GENTIAN FAMILY.)

Gentiana

359. quinqueflora, Lam.; *Five-flowered Gentian.*
360. crinita, Froel.; *Fringed Gentian.*
361. detonsa, Fries.; *Smaller Fringed Gentian.*

362. alba, Muhl.; *Whitish Gentian.*
363. Andrewsii, Griseb.; *Closed Gentian.*
364. puberula, Michx.; *Blue Gentian.*

APOCYNACEÆ.

(DOGBANE FAMILY.)

Apocynum

365. cannabinum, L.; *Indian Hemp.*
366. androsæmifolium, L.; *Spreading Dogbane.*

ASCLEPIADACEÆ.

(MILKWEED FAMILY.)

Asclepias

367. Cornuti, Decaisne; *Common Milkweed.*
368. ovalifolia, Decaisne; *Milkweed.*
369. phytolaccoides, Prush.; *Poke Milkweed.*
370. purpurascens, L.; *Purple Milkweed.*
371. incarnata, L.; *Swamp Milkweed.*
372. tuberosa, L.; *Butterfly weed.*

Acerates

373. viridiflora, Ell.; *Green Milkweed.*

OLEACEÆ.

(OLIVE FAMILY.)

Fraxinus

374. Americana, L.; *White Ash.*
375. pubescens, Lam.; *Red Ash.*
376. sambucifolia, Lam.; *Black Ash.*

ARISTOLOCHIACEÆ.

(BIRTHWORT FAMILY.)

Asarum

377. Canadense, L.; *Wild Ginger.*

Aristolochia

378. Sipho, L'Her.; *Pipe-Vine.*

NYCTAGINACEÆ.

(FOUR-O'CLOCK FAMILY.)

Oxybaphus

379. nyctagineus, Sweet; *Oxybaphus.*

CHENOPODIACEÆ.

(GOOSEFOOT FAMILY.)

Chenopodium

380. *album*, L.; *Pigweed.*
381. *hybridum*, L.; *Maple-leaved Goosefoot.*

AMARANTACEÆ.

(AMARANTH FAMILY.)

Amarantus

382. *retroflexus*, L.; *Amaranth.*
383. *albus*, L.; *White Amaranth.*

POLYGONACEÆ.

(BUCKWHEAT FAMILY.)

Polygonum

384. acre H. B. K.; *Water Smartweed.*
385. amphibium, L., var. aquaticum, Willd.; *Water Persicaria.*
386. aviculare, L.; *Knotgrass.*
387. aviculare, L., var. erectum, Roth.; *Knotgrass.*
388 dumetorum, L.; *Climbing False Buckwheat.*
389. Hydropiper, L.; *Common Smartweed.*
390. *orientale*, L.; *Prince's Feather.*
391. lapathifolium, Ait.; *Smartweed.*
392. incarnatum, Ell.; *Knotweed.*
393. *Persicaria*, L.; *Lady's Thumb.*
394. tenne, Michx.; *Knotweed.*

Rumex

395. orbiculatus, Gray.; *Great Water Dock.*
396. Britannica, L.; *Pale Dock.*
397 crispus, L.; *Curled Dock.*
398. *Acetosella*, L.; *Sheep Sorrel.*

ELAEAGNACEÆ.

(OLEASTER FAMILY)

Shepherdia

399. Canadensis, Nutt.; *Canadian Shepherdia.*

SANTALACEÆ.

(SANDALWOOD FAMILY.)

Comandra

400. umbellata, Nutt.; *Bastard Toad-Flax.*

EUPHORBIACEÆ.

(SPURGE FAMILY.)

Euphorbia

401. polygonifolia, L.; *Shore Spurge.*
402. corollata, L.; *Flowering Spurge.*
403. *Cyparissias*, L ; *Garden Spurge*
404. heterophylla L.; *Spurge.*
405. hypericifolia, L.; *Spurge.*
406. maculata, L.; *Spurge.*

Acalypha

407. Virginiac, L.; *Three-seeded Mercury.*

URTICACEÆ.

(NETTLE FAMILY.)

Ulmus

408. fulva, Mich.; *Slippery Elm.*
409. Americana, L.; *White Elm.*
410. racemosa, Thomas; *Rock Elm.*

Celtis

411. occidentalis, L.; *Sugarberry.*

Urtica

412. gracilis. Aiton.; *Nettle.*
413. *dioica*, L.; *Stinging Nettle.*

Laportea

414. Canadensis, Gaudich; *Wood-Nettle.*

Cannabis

415. *sativa*, L.; *Hemp.*

Humulus

416. Lupulus, L.; *Hop.*

JUGLANDACEÆ.

(WALNUT FAMILY.)

Juglans

417. nigra, L.; *Black Walnut.*
418. cinerea, L.; *Butternut.*

CUPULIFERÆ.

(OAK FAMILY.)

Quercus

419. alba, L.; *White Oak.*
420. coccinea, Wang, var. tinctoria, Gray; *Black Oak.*
421. macrocarpa, Michx.; *Bur Oak.*
422. rubra, L.; *Red Oak.*

Corylus

423. Americana, Walt.; *Hazle-nut*

Ostrya

424. Virginica, Willd; *Iron Wood.*

Carpinus

425. Americana, Michx.; *Water Beech.*

BETULACEÆ.

(BIRCH FAMILY.)

Betula

426. papyracea, Ait.; *Canoe Birch*
427. pumila, L.; *Low Birch.*

Alnus

428. incana, Willd.; *Speckled or Hoary Alder.*

SALICACEÆ.

(WILLOW FAMILY.)

Salix

429. cordata, Muhl.; *Heart-leaved Willow.*

430. humilis, Marshall.; *Prairie Willow.*
431. lucida, Muhl.; *Shining Willow.*

Populus

432. tremuloides, Michx.; *American Aspen.*
433. monilifera, Ait.; *Cotton-wood.*

CONIFERÆ.

(Pine Family.)

Pinus

434. Strobus, L.; *White Pine.*

Juniperus

435. Virginiana L,; *Red Cedar.*

ARACÆ.

(Arum Family.)

Arisæma

436. triphyllum, Torr.; *Indian Turnip.*
437. Dracontium, Schott.; *Green Dragon.*

Calla

438. palustris, L.; .*Water Arum.*

Symplocarpus

439. fœtidus, Salisb.; *Skunk Cabbage.*

Acorus

440. Calamus, L.; *Sweet-Flag.*

TYPHACEÆ.

(Cat-tail Family.)

441 latifolia, L.; *Common Cat-tail.*

Sparganium

442. Simplex, Huds.; *Bur-reed.*

NAIADACEÆ.

(Pondweed Family.)

Potamogeton

443. amplifolius, Tuck.; *Pondweed.*

444. natans, L.; *Pondweed.*
445. pauciflorus, Pursh.; *Pondweed.*

ALISMACEÆ.

(WATER-PLANTAIN FAMILY.)

Alisma

446. Plantago, L., var. Americanum, Gr.; *Water Plantain.*

Sagittaria

447. variabilis, Engelm.; *Arrow-head.*

ORCHIDACEÆ.

(ORCHIS FAMILY.)

Spiranthes

448 gracilis, Big.; *Ladies' Tresses.*

Calopogon

449. pulchellus, R. Br.; *Grass Pink.*

Cypripedium

450. candidum, Muhl., *Small White Lady's Slipper.*
451. parviflorum, Salisb.; *Smaller Yellow Lady's Slipper.*
452. pubescens, Wild.; *Larger Yellow Lady's Slipper.*
453. spectabile, Swartz.; *Showy Lady's Slipper.*

AMARYLLIDACEÆ.

(AMARYLLIS FAMILY.)

Hypoxis

454. erecta, L.; *Star-Grass.*

IRIDACEÆ.

(IRIS FAMILY.)

Iris

455. versicolor, L.; *Larger Blue Flag.*

Sisyrinchium

456. Bermudiana, L.; *Blue-eyed Grass.*

DIOSCOREACEÆ.

(YAM FAMILY.)

Dioscorea

457. villosa, L.; *Wild Yam-root.*

SMILACEÆ.

(SMILAX FAMILY.)

Smilax

458. rotundifolia, L.; *Common Greenbriar.*

LILICEÆ.

(LILY FAMILY.)

Trillium

459. grandiflorum, Salisb.; *Wake-Robin.*
460. erectum, var. declinatum, Gr.; *Birthroot.*
461. cernuum, L.; *Nodding Trillium.*
462. nivale, Riddell; *Dwarf White Trillium.*

Zygadenus

463. glaucus, Nutt.; *Zygadene.*

Uvularia

464. grandiflora, Smith; *Bellwort.*

Smilacina

465. racemosa, Desf.; *False Spikenard.*
466. stellata, Desf.; *False Solomon's Seal.*
467. bifolia, Ker.; *Two-leaved,Solomon's Seal.*

Polygonatum

468. biflorum, Ell.; *Smaller Solomon's Seal.*
469. giganteum, Dietrich; *Great Solomon's Seal.*

Asparagus

470. *officinalis*, L.; *Garden Asparagus.*

Lilium

471. Philadelphicum, L.; *Wild Red Lily.*
472. superbum, L.; *Turk's-Cap Lily.*

Allium

473. stellatum, Nutt.; *Wild Garlic.*
474. Canadense, Kalm.; *Wild Garlic.*

JUNCACEÆ.

(Rush Family)

Lazula

475. pilosa, Willd.; *Wood Rush.*
476. campestris, DC.; *Wood Rush.*

Juncus

477. filiformis, L.; *Bog Rush.*
478. effusus, L,; *Soft Rush.*
479. nodosus, L.; *Bog Rush.*
480. pelocarpus, E. Meyer; *Bog Rush.*
481. tenuis, Willd.; *Bog Rush.*

PONTEDERIACEÆ.

(Pickerel-weed Family.)

Pontederia

482. cordata, L.; *Pickerel-weed.*

COMMELYNACEÆ.

(Spiderwort Family.)

Tradescantia

483. Virginica, L.; *Common Spiderwort.*

EQUISETACEÆ.

(Horsetail Family.)

484. arvense, L.; *Common Horsetail.*
485. sylvaticum, L.; *Wood Horsetail.*
486. hyemale, L.; *Scouring Rush.*

FILICES

(Ferns.)

Polypodium

487. vulgare, L.; *Polypody.*

Pellæa

488. gracilis, Hook ; *Cliff Brake.*
489. atropurpurea, Link.; *Cliff Brake.*

Pteris

490. aquilina, L ; *Common Brake*

Adiantum

491. pedatum, L.; *Maiden hair.*

Camptosorus

492. rhizophyllus, Link.; *Walking Leaf.*

Asplenium

493. thelypteroides, Michx.; *Spleenwort.*
494. Filix-fœmina, Bernh.; *Lady-Fern.*

Aspidium

495. Thelypteris, Swz.; *Wood Fern.*
496. Noveboracense, Swz.; *Shield Fern.*

Struthiopteris

497. Germanica, Willd.; *Ostrich Fern.*

Cystopteris

498. fragilis, Bernh.; *Bladder Fern.*
499. bulbifera, Bernh.; *Bladder Fern.*

Woodsia

500. obtusa Torr.; *Woodsia.*

Dicksoina

501. punctilobula, Kunze.; *Dicksonia.*

Osmunda

502. Claytoniana, L.; *Flowering Fern.*
503. cinnamomea, L.; *Cinnamon Fern.*

Botrychium

504. ternatum, Swz.; *Moonwort.*

This catologue contains the herbs, shrubs and trees of Lake Pepin Valley as far as I know them. The two large families of Grasses and Sedges are omitted, simply because I am not sufficiently familiar with them to make a list. There are doubtless many mistakes and omissions, but I have done the best I can, with my present knowledge, and therefore make no apology.

SARA MANNING,
Lake City, Minnesota.

DISCUSSION ON MISS MANNING'S PAPER.

At the conclusion of the reading of this paper, Mr. J. C. Plumb, of Wisconsin, arose and said: Mr. President: I have listened with so much interest and admiration to the reading of the paper we have just heard, that I wish to congratulate your society upon having taken up such a subject and made so good a beginning in the treatment of it. The paper is commendable from several points of view. First, it shows a practical acquaintance with the abundant flora of the region, as well as an intelligent and a novel arrangement in the order of presentation, based upon the habitat of the native plants. Commencing with the lowest valley and ascending to the summit of the bluffs, or passing from prairie to woodland, and from bench to swale, the writer finds and describes to us at each step a new variety or species. Second, it is an illustration of the prevalence of natural selection or adaptation in plant life to certain soils and aspects; and a valuable lesson in horticulture was that where she found the most delicate plants upon the northern slope of the bluffs. I hope your society will encourage such valuable efforts in this work of exploring the natural treasures of horticulture which abound in the northwest. It is a neglected field, and yet one in which there should be many such workers, as the writer of this paper; and not only is the field of botany open, but in entomology and ornithology, in both scientific and economic relations, is there a similar need of careful study in the west, and they, with botany, are especially adapted to the capacity and nature of our young women.

Mr. McHenry. I wish to inquire of Miss Manning whether she has ever found the trailing arbutus in the Lake Pepin Valley.

Miss Manning. I have never met it near Lake City. If found in our part of the state it must be very rare.

Mr. Golden. I have seen it near Plainview, in Wabasha county, where I live.

Mr. Porter and other members spoke in terms of high appreciation of the paper.

Mr. Emery. Mr. President : In order to express what this discussion shows to be the general sentiment of the society, I move that a vote of thanks be tendered to Miss Manning for her valuable paper ; that she be declared an honorary life member, and that we request her to continue her contributions in botany for the benefit of our future meetings and for publication in the annual reports.

The motion being seconded, was adopted by a unanimous vote.

MORNING SESSION.

Second day, Wednesday, January 16th.

The discussion of the paper of Mr. Sias, read last evening, being first in order, Col. Robertson, said:

Mr. President:

I endorse the remarks of Mr. Sias about the value of the Cottonwood. It is one of the poplars, which derive their general name from the fact that they are the people's trees; easily grown, thrifty, adapted to many climates, soils, situations and aspects; hence *popular*. The only objection to it as a street tree is its cotton, which is often complained of as a nuisance in houses and about the walks. To avoid this cotton where it is objectionable, we have only to select cuttings from the male trees, as it is the female trees which bear the cotton. When the trees are in bloom the males can be distinguished by the absence of the cotton and marked.

Mr. Sias. I am glad to be reinforced by Col. Robertson in my estimate of the value of the Cottonwood. I agree to what he says about avoiding the cotton for street trees, by selecting cuttings from the males; but for general purposes of forests and windbreaks, the cotton is nature's provision for distribution of the seeds. They rise upon the winds and are floated and born about for long distances and over vast tracts of country, falling and germinating oftentimes where most needed and where otherwise they would not be found. For this reason I say let the cotton fly till the tornadoes quit.

Secretary Gibbs. While the cottonwood is undoubtedly adapted to any part of Minnesota, our reports are looked to as authority in tree culture for vast districts to the Northwest of us, and we must be careful and not mislead our friends anywhere. It was my good fortune to be one of a number of members of the American Forestry Congress who went out on the Northern Pacific Railroad last August as far west as Mandan, on the Missouri river, opposite Bismarck, and I found that it was the opinion of the scientific foresters in that company, frequently expressed from day to day as we journeyed along, that the cottonwood would not endure the dry climate of Western Dakota; that after you pass out of the alluvial soils of the Red River district, closing westerly with the Cheyenne Valley, this tree must necessarily be short-lived except along the low margins of streams. Its natural limit of life being from ten to fifteen years in the dry regions, and apt to be shorter unless sustained by excessive irrigation.

On our arrival at Bismarck we found a striking proof of this conclusion of science. On the farm of Mr. Jackman, at Bismarck, in a basin of one of the Missouri benches (the situation being the most favorable of any outside of the Missouri levels themselves. where water is deposited by the floods,) we found a plant of cottonwoods some twelve years of age, surrounding a three-acre garden, and were informed by the proprietor that they had been kept alive at an expense of eleven hundred dollars for hauling water to them from the Missouri. In the line of these trees as they passed around the garden were some elevations and depressions, and most of the trees on the elevations had begun to die from the tops down, evidently for the want of sufffiicent moisture in the ground and in the air to sustain them at their present age. The total precipitation, rain and snow, in that region is only about twelve inches annually, as against 30 to 40 in Minnesota, and it is perhaps safe to suspect, at least, that, in such aridity, the cottonwood is not the tree that will be profitable. I would prefer not to give any names, but leave the scientists of that party to speak for themselves; but as the railroads have been spending large sums of money in cottonwood planting on these dry western plains, and the people are following their example, attention should be directed to this question of adaptation in forestry with the view of ascertaining if we have any really valuable tree that will grow to maturity there, away from the river bottoms. Prof. Budd claims that the Russian form of the white poplar (*Populus Alba)* or silver-leafed poplar, has this adaptation, and; besides, that the tree is upright in growth like our American white pine, does not sucker like our American white poplar, and that its wood is of such a nature as to make it almost as valuable as the white pine for manufacturing and all the purposes of timber. It is said by Prof. Bessey, as I have been informed, that its adaptation to arid regions comes, like that of a large class of other plants and trees of like adaptation, from its peculiar cell structure, which has a cap on its upper surface, closing in dry periods when necessary and resisting loss of moisture by evaporation. The box elder, or ash-leaved maple, is also thought by many to be adapted to regions too dry for the cottonwood. What has misled our people about the adaptation of the cottonwood is that it grows almost anywhere while it is young.

NATIVE PLUMS.

By O. M. Lord, of Minnesota City.

No wild fruit is more widely or abundantly distributed in this country than the plum. Along the margins of all the streams, and in almost every locality of moist land not subject to annual fires, groves of them abound, which produce in some years large quantities of excellent fruit. No wild fruit more readily responds to cultivation, in producing quantity and improvement in quality, and I would invite increased attention to its merits on the part of the State Horticultural Society, and also on the part of those who cannot give the subject of fruit culture much attention. There are hundreds of homes all over the country entirely without fruit, that might be provided with it by a small outlay of time and labor, without money, in the cultivation of native plums. President Harris says, in the last report:

" We have some choice native varieties well worthy of propagation." I believe this statement so true, is not appreciated in full, as with one or two exceptions, these choice varieties are comparatively unknown, or at the most have only a local celebrity, and the object of this paper is to call the attention of the society to them, that their merits may be discussed and compared, and the results disseminated, which is a shorter and better method for the masses to obtain good fruit than individual experimenting.

This fruit has received from the Illinois and Iowa Societies, marked notice.

Prof. Budd, at the Iowa Agricultural College, has a large collection of natives for testing, with the kinds commonly cultivated, and the opinion is prevalent among fruit men, that we must look to the natives for any great improvement upon our cultivated varieties which are not hardy in this latitude. Some of the blue plums have occasionally succeeded in this vicinity. Mr. Wilcox, of La Crosse, has fruited Moore's Arctic with some success, and Mr. B. Taylor, of Fillmore county, has had moderate success with a blue plum, from Iowa. Mr. Bollman, of Winona county, has top-worked some natives with a large blue plum, and produced several good crops. With these exceptions, I have not been able to learn that any one has been successful with the varieties usually found in the eastern and southern nurseries.

So far as I am informed, the only efforts to improve the natives in this vicinity have been in selecting from the groves, and simply transplanting, without any particular system of after culture. In this county a good many trees have been transplanted without any proper selection, taking the first at hand. In almost every case this method has proved unsatisfactory from the poor quality of the fruit. A better plan is to carefully observe the quality of the fruit as it grows naturally, and mark the trees, and afterwards at the proper season, transplant. If the trees are too large or too old, cut the roots, leaving them in the ground to sprout, and transfer the small trees. By this means you are sure to get fruit of the same kind, while planting the seeds might produce many varieties not equal to the original. Only a few of the natives have as yet been brought into prominent notice, but there are scattered here and there a good many valuable kinds that should be more widely known. Prof. Budd, in the Iowa report, mentions some natives, as worthy of cultivation.

Mr. B. Taylor, of Fillmore county, has been experimenting for twenty years or more, and has produced some which he considers superior to any wild ones in market. Mr. Cottrell, of Olmstead, has one which has taken the premiums at the fairs, and is pronounced excellent by all who have tested it. The late P. A. Jewell, several years ago, found on the grounds of Mr. Brainerd, of this county, what he considered a very superior variety which he propagated and named Brainerd's Best.

Of those which are known to be adapted to general cultivation, the Desoto heads the list. The Forest Garden is quite prominent. The Weaver is successful, and some of the Chickasaw varieties in some locations do very well, but there are many others comparatively unknown, that in quality and desirability compare favorably with any of those mentioned, and if they could be brought into notice by propagation, would be considered valuable additions to our list of fruits.

A prominent fruit dealer of Winona informs me that he has frequently received some of our natives, that in quality were superior in every respect to many of the old kinds that were offered in the market, not excepting the little damson, nor the far-famed Californias.

By far the larger part of our natives do not differ materially in character; I believe the species in America is limited to three: the sand or beach plum of the Atlantic coast, the chickasaws of the Gulf States and our common wild plum. This latter is too well known to need description here; but there are a few points that need to be borne in mind in making selections for improvement. As a rule, this species has a thick acrid skin, which in cooking has a tendency to dry up and toughen; a soft, juicy pulp, which spoils in carrying, and an acrid taste about the seed, that imparts often a disagreeable flavor.

Whenever a native can be found with a skin that is thin and tasteless, which disappears in cooking, with a pulp fleshy instead of juicy, and with the seed small and free, we may be sure of something worth propagating. Prof. Budd says the Speer plum possesses the first of these qualities, and is excellent for cooking. Mr Taylor has secured among his, one with the second, a fleshy pulp with a rich peachy flavor, of large size, bears carrying well, and valuable for table use. Mr. Cottrell's plum, and some others growing in this and adjoining counties, possess very nearly all these desirable qualities. They are also from one to three weeks earlier than the Desoto, but do not appear so fine in the market. They have, however, one quality which makes them for canning superior ; when mature the skin slips off easily, leaving the pulp firm and shapely.

As in the cultivation of all fruit there are some difficulties to encounter, it may be well to mention some of the most common to the plum. The curculio is probably the greatest; the black knot is next, and there is a tendency of all wild ones to rot on the tree when brought into cultivation.

Probably no good plum will be found to be curculio proof. Nature beats them with numbers of trees and quantity of fruit. This may be a hint to us ; but the journals have thoroughly discussed this part of the subject, and have attempted to point ou remedies. The black knot when it attacks is very destructive. A writer in one of the prominent New England journals claims that it is occasioned by poverty of soil, and poor cultivation. This is a mistake, as natural groves of thrifty wild ones are frequently entirely killed by it. The only safety lies in carefully cutting out and burning every appearance of it, by which means it can be prevented from doing any harm.

In regard to rotting on the tree, it is found that some varieties are much more liable than others, but close pruning of the tree and thinning of the fruit are the most effectual remedies. As an offset to these difficulties in growing the trees, its advantages are that it is tenacious of life, and adapted to all our soils, whether on the stiff clays of the high lands or on the light sands of the river bottoms; it withstands our hardest winters, being perfectly hardy, and is as prolific as any tree that bears fruit. It is also easily propagated, either by budding, any manner of grafting, growing from pieces of the root, or planting the seed.

DISCUSSION OF MR. LORD'S PAPER.

Mr. Emery. Does the curculio spoil the plum when it fails to puncture the pit?

Mr. Golden. Yes. I find a small black spot where the insect simply pierces the skin. It there deposits the egg, and if the larvæ is strong enough, it makes its way in and destroys the plum.

Mr. Emery. I think the egg is deposited usually within two weeks after the appearance of the bloom, but if the pit is not punctured, the egg dies, the wound heals up, the plum, though somewhat injured, grows on to maturity. This is my conclusion after considerable observation of the plums we have growing in this state.

Mr. R. Porter recommended scraping the rough bark from the trees, thus removing the hiding place of the curculio.

Mr. Gideon had tried sprinkling his trees with a weak solution of coal tar and chloride of lime. Went over them three times, always repeating the operation after a rain. He found the remedy successful. Few plums and not a single peach were injured.

Secretary Gibbs. The best remedy I have seen for the curculio, was pointed out to me last September by Dr. E. Lewis Sturtevant, director of the New York Agricultural Experiment Station, at

Geneva. He took me into a little plum orchard of about thirty trees, surrounded by a high picket fence. The trees were then loaded with fruit, only about three per cent. of which showed any injury from the "Little Turk" or any other insects. A dozen hens were kept confined there, and their natural desire and necessity for animal food, held them close enough to the insect bill of fare to reduce the loss of fruit to a very moderate limit. Outside this enclosure were a few plum trees belonging to the same orchard, whose fruit was entirely ruined by the curculio.

Mr. Gideon. The hens have the range of our plum orchard, and the trees are full of curculios.

The Secretary. Are the hens confined there?

Mr. Gideon. No.

The Secretary. That tells the story. They are not obliged to eat curculio, for they can find animal food that they like better. You can compel hens to eat potato bugs by confinement, and when the appetite is created, they will eat them voluntarily, as some of our human folks will tobacco.

Mr. Emery. Does the benefit from hens go over to next year?

Secretary Gibbs. In a measure doubtless, as the hens take them mostly in the chrysalis state.

Mr. Gideon. There is a native blue plum in the Lake Minnetonka district, similar to the damson, and I have heard of another native at Lake Osakis that is said to be as large as a hen's egg.

Mr. Whipple. I am well acquainted with the wild fruit of Lake Osakis. It is no larger than we have at Lake Minnetonka. I have been experimenting with the hen and insect question for ten years. Confining the hens compels them to destroy the insects. From a clump of plum trees near my house, where the hens have their promenade, we get plenty of fruit, when other trees not so protected, yield none.

Secretary Gibbs. We are continually receiving accounts of new and desirable fruit in various parts of the state, but as yet the society has failed to utilize this information. I am convinced that the only way to do it, is to have some one authorized to search these things out, and if promising, to pack and distribute cions.

Mr. Gideon. I think an agent should be sent out for this purpose.

Truman M. Smith. Mr. Lord sent me a box of his plums, and I think they were the best native plums I ever saw.*

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*NOTE BY THE SECRETARY.—Since this meeting I have visited Mr. Lord and examined his trees, and would recommend applications to him for cions for grafting on common wild plum trees. This may get me into trouble with Mr. Lord, but I trust he will overcome his modesty and sell the cions.

Secretary Gibbs. Elisha Hale, of Lansing, Iowa, gives this account of the DeSoto plum. He has handled more of them and seen more of the fruit than any other man—in fact was the first to give it a wide introduction :

"My experience with it dates back 20 years and over. The tree is perfectly hardy—have never seen a twig killed by frost. The tree is a good grower, a prolific bearer, the fruit large, and of fine quality. Plums 1¼ inch in diameter are not uncommon. The only fault I have to find with the tree is an inclination to overbear and break down or else give inferior fruit. The fruit buds and blossoms are hardy. In 1883 I did not get a crop of plums, but some of my neighbors got a fine crop that year. Trees only 5 or 6 feet in height frequently bear the year they are set out—DeSoto trees bear much earlier than the Miner. As to their bearing every year, I can say that the trees frequently bear 3 or 4 years in succession. The trees in my lot in Lansing were planted in the spring of '64, and have borne about 14 good crops. The DeSoto does not make as large a tree as the Miner, but when full grown covers about 20 feet, or 10 feet each way.

A grafted DeSoto bears quicker than one from a sprout or sucker. But from my experience I prefer this tree on its own roots. But it absolutely will not grow from root cuttings like the Miner. The fruit is destroyed more or less by curculio. But it does not rot from the puncture of the insect like some thin-skinned tame plums. Many will mature and make fine plums, even when cut in several places. The fruit ripens about the last week in August, continuing from first to last about 8 days."

C. Barnard, of Waukon, in the same county, writes to F. K. Phenix: "The DeSoto plum is the best we have tried. We got it in '66 from the original tree near DeSoto, Wisconsin. We named it, and were the first to graft it. It is fully the size of the Miner or larger, more round in shape; color, yellowish red, good for eating or cooking. The tree is hardy and productive.

Mr. Gould's paper on blight being called for was read by the author, and was as follows:

FIRE BLIGHT IN FRUIT TREES.

BY F. G. GOULD, OF EXCELSIOR, MINN.

The disease in fruit trees known as fire blight first developed in this region about twelve years ago. It is a contagious disease; for when it once gets into a orchard it is liable to spread into every tree. Sometimes it drops into a nursery of young trees and destroys every one for rods around.

In the eastern and middle states this disease is known by the name of Pear Blight. Its ravages are found at intervals all the way from Maine to Dakota, and from Minneapolis to Texas. When it first came to this region, its course was from east to west; we heard from it in Wisconsin before it reached here ; it then took five or six years for it to travel to Meeker county, fifty miles west of this point. Only for this scourge every family living on a farm in Minnesota could have a supply of apples at least of the rich and fruitful Transcendant crab.

It was believed by many at first to be the effect of some peculiarity in the weather or the electricity in thunderstorms, and by others it was thought to be the work of insects, but now, I think, we may as well settle down to the conclusion that blight perpetuates itself by the transmission of its virus in the atmosphere being blown about by the winds.

Unfavorable conditions of the weather or excessive fertilization puts a tree in condition to take the blight on the same principle that yellow fever, small-pox and cholera are most destructive in communities whose vital forces have been weakened by unfavorable surroundings, habit or diet.

It is a well-known fact that some varieties or families of trees are much more subject to blight than others; in fact, it usually, if not always, begins in the crab trees or their relatives, and then spreads to others standing near, which perhaps are less susceptible, and never would have blighted except for the infection or virus from the blighting crabs which overpowered them.

From the best information at hand, this disease was imported from Russia, being first brought to Russia from China, or, perhaps, was brought direct from China to this country. Many remedies have been recommended. The best, in my opinion, is lime applied to the trunks and branches of trees in the form of whitewash; and, in my observation, where this has been done they rarely, if ever, blight.

In conclusion. I will say that we may reasonably hope to see the end of this scourge by-and-by, on the general principle that epidemics and various other evils spend their force in time and depart. However, this may be, we have another faith to hang our hopes upon—the belief that the steppes of Russia will furnish us a race of trees, both of the apple and the pear, with constitutions robust enough to resist the ravages of blight and the great extremes of our climate.

BLIGHT.

By M. Pearce, of Minneapolis, Minn.

In all my experience with rust on wheat and blight on fruit trees, unless the straw, new wood or portions of the leaves were ruptured, no serious harm occurs; or in other words, where there is no rupturing, blight will not exist.

The question then arises, what causes the rupturing of the bark on the new wood and also portions of the leaves?

On philosophic principles, we must come to the conclusion it is the result of a rapid or spasmodic growth, caused by excessive heat and moisture at the roots of the trees, which can be overcome by keeping the soil over the roots of the trees covered with loose mulching four or five inches deep, as far out as the roots extend. I use corn stalks, marsh hay, bean straw, potato vines, or anything of the kind I have on hand. This will give a constant, even and healthy growth, and the trees will never blight if the application is made in the fall or early in the spring; no, not even the Transsendents, which of all trees are the most subject to blight. Mulching is recommended by all scientific writers and close-observing fruit growers. I do not wish it understood that rupturing produces blight, far from that, but it paves the way for something that does, of which we will write. Among the lowest limits of the vegetable kingdom exists a very low order of vegetable life known as Bacteria, so extremely small that it requires a microscope that will give from one to two thousand diameters to bring it to view.

It is supposed to contain as many varieties as the visible kingdon that grows from the soil and possesses as many different qualities. It produces spores or seeds so rapidly that no numbers can express them.

The air and water contain millions of these spores or germs to the square inch; every plant and tree is covered with them. Thousands are taken in at every breath, and as many more are taken into the stomach and intestines every time we swallow. The mouth of every animal is literally full of them. The scientific world are at present, and have been for years, studying the nature of those germs. Several have been minutely described and named, and also what disease they are supposed to produce. One specie known as micrococci is supposed by some to produce diphtheria. An other specie Bacillus tuberculosis are very numerous in consumption. Microbe of hydrophobia is supposed to produce that disease. The germ Bacterium is supposed to produce the blight on fruit trees, and others the rust on wheat, and so on. Those germs have never been known to attack healthy tissue, but are found in endless numbers on sores, ulcers, putrid flesh in all diseased or dead matter. If it was the nature of those germs to subsist on healthy plants and vegetables and healthy animal life, no living visible thing could exist. It is only on sick or dead matter that they multiply and subsist.

Now when we apply a specie of those germs as the cause of blight, the evidence is very strong that they are the direct cause. The moment the bark bursts and the sap oozes out, it is filled with millions of those spores, and the virus at once poisons the sap, and death ensues as far as the poison sap extends.

Cutting off the blighted portions of the tree is of no benefit unless the wound is at once saturated with carbolic acid, or made air-tight with some kind of wax.

Mr. Gideon. Mr. President, while this subject of blight is before the Society I will add one more paper to these already read.

The President. Very well, we will also hear Mr. Gideon's paper before proceeding with the discussion.

Mr. Gideon then read his paper:

BLIGHT, ITS CAUSE AND CURE.

I wish you a happy and prosperous meeting, and that great good may come of it, by your developing facts, that the light will so shine that the world may see and embrace the truth, until ignorance and want are seen and felt no more, and to that end I will add a few thoughts on the subject of blight—the cause and the remedy.

That blight is a malady that floats in the atmosphere is a well-defined fact in its freaks with us, and runs in atmospheric currents, sometimes only a few feet in width, and at other times in a great wave as it were miles in width, but like a tornado, the greatest ruin at its center. For years we have noted its freaks, and perhaps no one fruit grower has had more of it on his grounds than we, more or less, each season for the last 12 years; but the greatest ruin done was in the month of June, 1881, when over a thousand bearing trees were killed dead, and twice as many more badly damaged, their death being only a matter of time, for when the blight strikes on the body of a tree it is death sooner or later. Certain it is a great calamity close akin to the cholera, of which it is a pathfinder now on its third tour around the world, twice followed by the cholera and the cholera again on its track, with a power to expand that no quarantine can long hold in check. Cholera once in motion, like tree blight, is bound to travel wherever it can find congenial food to feed upon, which is debauchery, poverty, and filth; for it was those ingredients that set it in motion, and in quest of that food it travels; but when in motion the more pure and cleanly often fall a prey to it just as they should, as a punishment of the world at large for allowing the oppression that set the calamity in motion. That it was British oppression in India that set cholera in motion, I presume there is no question Then such a high tariff was put on salt that the poor could not buy it, not even allowed to use sea water, and the result a raging dysentery, which at last took the form of cholera, and swept over the world in the trail of the blight. The barometer shows storms to have an atmospheric path-finder, a current that goes before and opens the way, or in other words lays the track for the storm to travel on. And that cholera floats in the atmosphere no one questions; and is in reality an epidemic storm, though not upturning trees and houses like a tornado of wind, yet its destruction of human life is none the less fearful, and came out of Asia preceded by tree blight and the epizootic—the pathfinders—the warnings of worse to follow, and to guard against the one is to guard against the other—remove the cause that set them in motion. No remedy, nor quarantine yet tried can ward off or stay their ownward march nor ever can so long as there is congenial food ahead to tempt onward. To stop the onward march of these maladies, is to cut short the monopolies—feed the hungry and clothe the naked — make free air and water, give to each enough land to produce the needed comforts of life and no one allowed to hold more. The God of creation gave the earth a free gift to man, and made a curse to follow him who usurped more than his share, as well as to him who suffered himself to be robbed of his natural dues. And in their wake war, pestilence and death are ever sure to follow, in which all classes suffer.

That the mind of man controls the elements, facts are too numerous to admit of a question, for when any great excitement sways any considerable portion of earth's people, the elements take form, as is often noticeable about the time of exciting presidential elections, and when Washington's army lay at Valley Forge was had the coldest winter known in America up to that date, and not repeated until Charlestown was besieged during the rebellion; and when Charles Twelfth invaded Russia they had the hardest winter up to that date and not repeated until the winter Bonaparte burned Moscow; and again during the great French revolution of 1792-3, they had the hardest winter up to that date, and not repeated until Paris was besieged by the Germans, and so run facts in all ages and nations. And accordingly a greedy, grasping, selfish national mind will cut short the farm crop per acre, and in no great space of time turn the most fertile lands to barren wastes. Examples to the point bedot all times, and were facts well understood thousands of years ago, is evident from many ancient writers, who gave as warning to evil doers, if they did not relent, that all goodly things would pass from them, and that on the other hand, that peace and quiet would cause the deserts to become fertile and blossom as the rose. No doubt those ancients founded their conclusions on the data of facts, and since their day, facts to the point loom up in profusion on the four quarters of the globe. Arabia was once renowned for her fertile plains, her balmy breezes, and vast agricultural products, with a population variously estimated at from 40 to 100 millions, but now those plains are vast desert wastes swept by fearful storms, and only roamed over by bands of marauding thieves, the remnant of the well-to-do millions, as barren in mind as the sands over which they roam. But while power yet remained, their greed and self aggrandizement induced them to make conquests of other lands, and first to fall a prey to their greed were Palestine and Asia Minor, the then garden spots of the world, but now barren wastes. Yet not content, over into Egypt they went, then a nation of forty millions, now less than four millions of half naked brutal Arabs, and the greater part of the once fertile lands are now drifting sands. Thence onward they rode to the ruin of other well-to-do nations that lived on the south coast of the Mediterranean, now nearly the entire stretch a part of the great Sahara desert, dotted here and there by the most poverty stricken of mortal beings; rode down there after self aggrandizement, and following little else than war, piracy, theft and murder. The Arab's greed made ruin at home, and ruin wherever he strode. At his tread fertile fields turned to sands, and to match his breath, balmy breezes mounted up to great desert storms, often burying or suffocating whole caravans of thousands in one drift. And of the plagues of Egypt all are familiar, and so of all other oppressed nations, all beset with plagues, and they on the increase in number and kinds, so that insects, blight, mildew or rot, is on every goodly thing we grow; and from year to year there is a falling off of crops per acre, new lands not yielding what new lands did twenty-five years ago. In the south, the negro was made a beast of burden—sold, whipped, and driven to unpaid labor—and the result, millions of acres of once fertile lands are now worthless. And in the north the Indian is driven from lands to those of less worth, and year by year on those lands our crops grow less, with insect enemies, blight, mildew and rot on the increase—a warning that worse is ahead, that utter ruin is the reward of persistent evil doing. The history of all ages, of men and nations, proclaims trumpet-tongued, that to be prosperous, is to be at peace; that evil, like good, brings its own reward. Though justice often appears to lag, the history of the past shows it is sure, that like great storms, the slower it comes the greater the shaking up when it does come.

Therefore, it behooves every thinking person to ponder well the signs of the times, bearing in mind the fact that Nature and Nature's God are one, and proclaim, though hand joined in hand, oppressors shall have a fall, and woe be to those who look calmly on oppression when that fall shall come.

The nation's foot has made one slip, and with the accumulated sins, frauds, oppressions and murders, another slip will be a crash as never seen before, and naught but a speedy change to the right can stay the nation and banish the evils that now beset us—monopolies, saloons (hell dens), wherein whisky, beer and tobacco are dealt out—a thousand fold more ruinous than insects, blight, mildew and rot combined.

PETER M. GIDEON.

Excelsior, Minn., Dec. 10, 1883.

DISCUSSION ON BLIGHT.

Col. Robinson spoke on the subject, but so rapidly that the notes are unreliable. Notes from his own pen have been applied for, and may appear in the Secretary's portfolio. He was understood to say that Mr. Gould's paper was correctly descriptive, and that Mr. Pearce was in the line of science as to the cause of blight.

Mr. Emery did not agree with the theory that only diseased matter is attacked. He thought all rank, soft growth should be avoided. A steady, even growth he considered the most favorable. We must keep our trees from growing too fast.

C. L. Smith mentioned a case where he saw severe blight on one end of a row of Transcendents that stood in good soil and showed a healthy even growth ; at the other end, with poor soil, but with heavy mulching, there was no blight.

Mr. Plumb. Blight is a secondary disease, and follows a disorganized condition of tissue. Crab trees blight more readily than apple, on account of their more compact structure, not so readily yielding to excessive sap pressure. They winter kill less for the same reason. Our best remedy against blight is to grow our trees moderately, neither allowing them to be forced or the soil to become impoverished. Thin soil, plenty of air, equal temperature near large bodies of water, are favorable conditions. Grow trees in the right way, and there will not be much danger. Grow slow, with moderate culture ; don't overfeed.

Mr. Emery. What tree is least subject to blight ?

Mr. Plumb. The Duchess of Oldenberg.

Mr. Gideon. Everything takes the blight on my grounds. I think there is no variety of the apple that the blight will not touch. Sometimes my Transcendents are the most exempt.

Mr. Plumb recommended the keeping of careful records of all facts appertaining to blight, temperature, storms, condition of trees of various kinds in periods of blight. He thought a knowledge of its causes would be thus eventually arrived at.

Mr. Pearce. I am not afraid of blight. I can stop it as easily as the itch.

Mr. Gould. You will get it yet.

R. Porter. I thought so once. So did Sias. But I have had it and so has Sias. Had it bad. It will come to Pearce yet.

Mr. Sias. Would it not be profitable to make application of chemicals ? He had heard of cases where kerosene cans have been hung on the trees, and the blight stopped, and had himself stopped it on a Flemish Beauty pear tree by cutting off the blighted limb and binding upon the wound a cloth saturated with kerosene.

C. L. Smith had known of similar results with the kerosene remedy.

The remainder of the morning session was occupied by the read- of the following communications.

DOES IT PAY A FARMER TO FOOL WITH APPLE TREES IN MINNESOTA.

The above question was asked me, to which I emphatically answered, no; yet I think that with due care and intelligence a farmer can make it both pleasant and profitable to raise apples in Minnesota. My opinion is based on my own experience, a part of which I will here give.

I have in my orchard a plat of land containing twenty-seven square rods on which stand twenty-seven apple trees. Some of them bore the first time this year, and some of them from overbearing last season had but few scattering apples on them, yet after supplying the wants of two families on the farm, I gathered and sold one hundred and nine and three-quarter bushels of apples, which, after paying freight, commission, etc., brought me $104.86 this being about six hundred dollars per acre for the use of the land, and one hundred times as much as my grain land netted. I shipped my crab-apples to St. Paul in sugar barrels, and received $4.09 net for them per barrel.

SIDNEY CORP,
Hammond, Wabasha County, Minn.

A NEW AND VALUABLE GRAPE.

ROSEMOUNT, MINN., Dec. 14, 1883.

Mr. Oliver Gibbs, Jr.

DEAR SIR: A Wild Grape has recently come under my observation which is surely worthy of your notice and general cultivation. It is in the door-yard of Mr. D. F. Akin, near Farmington, Minnesota.

Mrs. Akin told me last week, they brought it from Duchess county, N. Y., years ago. They call it a *Fox Grape*; but it is not the color of the fox grapes we knew east of the Mississippi; those were like the Catawba, and large as the Muscadine of the South.

This Akin grape is black, each grape large as the Concord; the clusters larger and compact. Of course it is not a table-grape, is sour, and best after frost. For cooking purposes is excellent; makes *delicious sauce, jelly, jam, pies and ketchup.* Then too, it is an iron-clad; (may be a Russian.) Bore bushels the past summer, even after last winter's abominable *40 and 45 degrees!* They never give it any protection; has long since outgrown its trellis and runs in luxuriant abandon over two or three adjacent trees.

Yours, truly,

HORTENSE SHARE.

On motion of Truman M. Smith, the reading of the report of the delegate to the American Pomological Society was made a special order for this afternoon.

AFTERNOON SESSION.

Second Day, Wednesday, Jan. 16th.

The exercises were opened by music by the University Glee Club.

Mr. Mendenhall, Entomologist of the Society, read the following report:

ENTOMOLOGICAL NOTES FOR THE SEASON OF 1883.

BY R. J. MENDENHALL, OF MINNEAPOLIS.

Mr. President, Ladies and Gentlemen :

As the years roll on our State is becoming more and more densely populated by a very undesirable class of immigrants; a class which appropriates to its use literally the fruits of others' labor, without even a civil "by your leave," and whose operations are conducted in such a stealthy and irregular manner that the farmer and horticulturist have no redress for the disappointments and losses occasioned by it. The only law against these marauders is " lynch law," but the rascals are more difficult to catch and more certain to reappear than were even the Younger and James boys in Missouri. It is needless to say that I refer to the annually increasing numbers of destructive insects that appear in our fields and gardens.

Minnesota has her share of beetles, bugs and worms that are " to the manor born," not to mention the afflicting mosquito, and all its blood-thirsty kindred, but among these were very few that showed a taste for cultivated vegetation, and for many years Minnesota enjoyed a happy immunity from the worst species of injurious insects. We even conceived and congratulated ourselves on the idea that our cold winter and late springs would forever exclude some of these from our borders. The fallacy of this opinion is forced upon us every year as one after another we recognize the grain and garden pests with which our sister states have long been afflicted. The ways of insects are, in this respect almost past finding out. Entomologists are learning that it is not safe to risk their reputations on the prediction that certain latitudes are too high or too low, or certain situations too wet or too dry, to be in danger from the ravages of this or that particular species. The only reliable conclusion is, that wherever wheat is grown, will be found sooner or later, the various insects that prey upon it; and so with corn, potatoes, cabbages, apples and other fruits. To this rule there are possible exceptions, but none of importance occur to my mind at this moment.

Since it cannot then be denied that we are subject to this annually increasing loss of farm and garden products through the depredations of these insignificant but potent foes, it is but proper to give them some attention, and that we devise and discuss plans for their extermination. And here I must repeat what I have said before, that to fight insects intelligently and to advantage, we *must* be able to recognize them in their different stages of development and be familiar with their habits. If we know the latter, we can often find them "off guard," and can destroy them by a very small outlay of labor and money, otherwise, while a destructive species *may* be headed off, to some extent, "by main strength and awkwardness," it is usually at a great expense of labor and of druggist's supplies.

I do not claim that the scientific entomologist is alone able to suggest the best measures to be taken against destructive insects, for the practical farmer or gardener, who has an observing eye and a mind capable of logical deductions, will often hit upon a better remedy than the man of cabinets and catalogues; but the methods of prevention are usually devised by the latter, and his aid is invaluable in enabling the unscientific observer to distinguish between insects whose work on grain or fruit or foliage has the same effect, but whose habits are so entirely different, that a remedy that would be effective against one, would be absolutely worthless against another.

As an illustration of this point, it was discovered some years ago that the ravages of the canker worm on the elm trees in one of our eastern cities, might be easily prevented by encircling the trunks with shallow tin troughs filled with oil, or by the application of bandages smeared with tar or refuse molasses or any other sticky substance. The philosophy of this remedy was, that the female canker worm moth, having no wings, and coming out of the ground was obliged to *crawl* up the trunk of the tree to reach the twigs] on which she naturally laid her eggs from which the worms were hatched. As she ascended the tree therefore, she would be obliged to cross the obstructions in her path, and would either be drowned in the oil or stuck fast on the viscid bandages; in either case she would perish without accomplishing the object of her life. This remedy had worked to satisfaction in the city referred to for some years, when the elms in another eastern city began to suffer serious defoliation. The "city fathers" of the latter, having no knowledge of any insect on the elm but the canker worm, put their city to considerable expense for oil troughs for the trees, and when, season after season, the ravages of the pest showed no diminution, could not conceive why a remedy that worked so well in one city should be absolutely useless in another. The riddle was finally solved by an entomologist who explained that the damage done in the last mentioned case, was not the work of canker worms, but that of a leaf-feeding beetle *Galeruca calmariensis*, Fabr., the female of which has ample wings with which she could readily fly from the ground into the branches of the tree and that she was not in the least inconvenienced by the oil troughs that had been placed for her destruction. So again the codling moth, the apple curculio and the apple maggot, are all destructive to the fruit of the apple, but the best methods for preventing the attacks of the first mentioned of these insects would be of no avail against the other two. These instances show conclusively the value of a knowledge of the differing forms and habits of differing species whose disastrous work on fruit or foliage may be very similar.

I am sorry to say that the study of entomology is still in its earliest infancy among us. It is indeed surprising that this branch of natural history should have so few votaries in a region so abounding with striking and beautiful insect forms. It has not by any means kept pace with its sister sciences of botany and ornithology, each of which have in our city alone, quite a number of excellent workers.

I am afraid the "bug hunter" is yet looked upon by most of our people as a sort of human curiosity, "not quite right in the upper story," who wastes his time hunting for worms and sticking butterflies in boxes, and is a fit subject for ridicule.

In this respect I am happy to state that our horticultural society is far in advance of local, popular opinion, and has always recognized the importance of and encouraged the systematic study of the insects affecting the food products of the State. But though *we* may be able to do but little to advance this study, it has made wonderful progress in other parts of the country during the last twenty years. Such a thing as economic entomology had then scarcely been heard of, and there were probably not fifty known students of the science in the country a quarter of a century back. Now we have hundreds of enthusiastic amateur and professional entomologists and a vast array of creditable publications. And here I beg leave to mention two works that have appeared within the year that are more than ordinarily instructive. One of these is a little volume on the "Insects Injurious to the Farm and Garden," compiled mainly from Prof. Riley's Missouri Reports, by Mrs. Mary Treat, and published by the Orange Judd Co., of New York. It is much condensed, but is a most convenient reference book on the subject of which it treats. The second work to which I allude is Mr. William Saunders' "Insects Injurious to Fruits," published by J. B. Lippencott, Philadelphia. Mr. Saunders is the editor of the Canadian Entomologist and also well known as a horticulturist of London, Ontario. His work should be in the hands of every fruit-grower and nurseryman. It is, as our appreciative secretary phrases it, one of rare excellence, with numerous clear and beautiful illustrations and plain and careful descriptions, by whose aid the mere novice can readily recognize the species of insects that are most destructive to his crops. The insects affecting each kind of fruit are conveniently grouped together and with each are given such remedies and preventive measures as have been thoroughly tested and found valuable.

With this rather long and rambling introduction I proceed to the consideration of the species of insects that were brought to my notice during the past season, either by observation or correspondence. The most important of these were the chinch bug, the boll or corn worm, the cabbage butterfly, the codling moth, the apple curculio, the grapevine flea beetle, the grape berry moth, the strawberry leaf roller and the strawberry sawfly. All of these insects have often been described and are familiar pests in many of the States to the south and east of us, although they may some of them, be quite new to us. It will only be necessary therefore for me to describe them in general terms and mention such discoveries in regard to their habits and the methods of treating them as have been recently brought out.

THE CHINCH BUG. (*Micropus leucopterus*, Say).

This ill-famed and ill-smelling bug—"chinck bug," as our German and Scandinavian friends call it, has already made a settlement among us in spite of our hopes and predictions that our climate would be too severe for his constitution, especially, since, according to Dr. Shimer, he is predisposed to bronchial troubles. We are not sure, indeed, that our climate will not be a help to him in that respect as it has been to so many biped invalids. However this may be, he shows the same voracious appetite for growing wheat and corn that has for years made him the most dreaded foe of the farmers of Illinois, Kansas, Missouri, and many other states. I have not as yet seen any statistics as to the amount of loss caused in this state by the chinch bug during the last season, but presume that in some sections it was considerable. The habits of this insect may be briefly recounted. It hibernates in straw piles, cornstalks, weeds, under boards, chips, and in rubbish of every sort, remaining dormant until the young wheat and oats are well started. It then makes its way to the roots of the grain and deposits a large number of very minute yellow eggs, from which hatch the little bugs that are at first blood red, but change to brown with a pale band across the back. These pierce the wheat stalk with their little beaks and when there are hundreds on a single stalk they soon exhaust the supply of sap and the plant dies. When one plant is exhausted they crawl to another and often migrate from field to field in the same way. Unlike the insects in higher orders there is no change to inactive pupæ with this species. The pupæ are only distinguished from the larvæ by having the rudiments of wings, and are as active and greedy in this stage as in any other. They require from five to six weeks for entire development, and as the females continue to oviposit for some time, their season is extended for more than two months, and the first brood overlaps the second. A singular fact in the habits of this insect is that although the perfect individuals have large and strong wings they never fly, except at the pairing season. They always *crawl* from one field to another and afford a singular spectacle when migrating, their armies being composed of little red larvae, large brown larvae, still darker pupæ with wing pads and mature males and females with black bodies and white wings.

The second brood appears in full force in August, and as small grain is then nearly ripe, this brood is most destructive to corn.

As to remedies, nothing very new has been discovered. The careful clearing up of rubbish, burning straw and cornstalks that harbor the insects during winter; rolling the land as late in the spring as is practicable, are among the preventive measures most highly recommended.

The migrations of this insect from one field or part of a field to another are often prevented by a strip of tar poured on the ground or on boards set on edge, about one gallon of tar being used to a rod. One or two deep furrows through which a stone or bundle of brush is dragged every day to keep the soil loose will also intercept the march of the chinch bug army, and vast numbers of them will be killed by the stone and the brush. As this bug is very fond of many other grasses besides wheat and oats, many farmers practice sowing Hungarian grass, or millet, with their small grain to divert the bugs somewhat from the latter; or they surround their fields with a border of these forage crops, on which the bugs which usually begin on one or more edges of the field, will feed until the choicer grain is sufficiently well grown to resist, in a measure, the attacks of the insect. Corn is sometimes saved in the same way by a belt of sorghum. I am informed by our secretary that many of our farmers sow clover with wheat, as the clover keeps the surface of the soil too cool to suit the habits of the bug. If this really has the effect claimed, the discovery is a valuable one, and the knowledge of it should be widely disseminated.

Prof. Forbes, State Entomologist, of Illinois, read a very interesting paper before the Biological section of the American Association for the Advancement of Science in our city last summer, in which he gave an account of a disease that had swept off a large proportion of the "chinches" that appeared in the spring. This disease was caused by *Bacteria*, and he was of the opinion that it could be widely spread by means of the germs of this *Bacteria* which could be multiplied to any extent in beef-tea and other infusions. This is, as yet, a mere theory, but it may lead to the discovery of a remedy.

As far as this bug is concerned the farmer's main reliance will continue to be in the occurrence of heavy rains in the fall and late in the spring. In such a season the bugs are sure to be washed away and drowned in such numbers that their injuries to grain will be light, while during dry and warm springs they may be expected to be more or less troublesome.

THE BOLL-WORM OR CORN-WORM. *(Heliothis armigera, Hubn.)*

This is another insect whose powers are not "contracted" by any "pent up Utica." It is in fact known all over the civilized world, and is, as a consequence of its extended range, by no means particular as to the kind of food set before it. Its appetite is not even limited to vegetable products, but it is not averse to an occasional meal off the pupæ of other catapillars, and it has frequently been caught in the cannibalistic act of devouring the smaller larvae of its own species.

In the southern states its voracity is mainly confined to corn and cotton, while in the northern states its ravages are most severe on corn and certain garden vegetables.

The moth from whose eggs this omnivorous worm, or more properly caterpillar, hatches, is a medium sized, plain looking insect with the fore wings of a pale clay-yellow, sometimes tinged with green, with markings of pale olive and dark gray. The body and underwings are dirty white, the latter with a brownish outer border.

This moth appears rather late in the spring and lays its eggs scatteringly on the buds or ears of the plant it prefers. The caterpillars are quite variable in shade, ranging from pale green to dark brown, and are marked with a number of fine dark longitudinal lines on the back and a pale yellow stripe on each side. They first attack the tassels of corn, boring back and forth through the buds before they have opened, and as soon as the ears have set they feed upon them by preference, eating first the silk, then the kernels in the milk and continue their ravages until the corn is ripe and hard. They go from one ear to another spoiling many that they do not actually devour. They also attack beans, cucumbers, pumpkins and various other garden vegetables. I found them this summer boring into my tomatoes, injuring both the green and ripe fruit.

In some parts of the country they have proved particularly destructive to this vegetable, robbing the market gardeners of from one-third to half the crop. As the presence of this worm is easily detected, the remedy is to go through the field or garden infested and gather and destroy the ears, buds or fruit in which it is working. The moths may also be trapped in the spring and again in July and August by placing shallow vessels filled with vinegar and molasses among the plants to be protected. This plan is quite extensively practiced in the cotton fields of the South. Turkeys will search eagerly for the worms and pick up great numbers that are about to enter the ground. Chickens also will chase and capture the moths.

THE EUROPEAN CABBAGE BUTTERFLY. (*Pieris rapœ.*)

As I predicted two or three years ago, this insect has invaded our gardens and cabbage fields, and during the past summer was the most serious pest with which we had to contend. The velvety green worms, with faint pink stripes on the sides are probably too familiar to every gardener to need any further description, but it is possible that there are some who do not yet recognise them as the progeny of the clouds of white butterflies that appear two or three times during the summer, and may be seen fluttering about and often alighting on the cabbages. Every one of these which can be caught and killed, if a female, reduces the number of worms from fifty to one hundred. As the flight of these butterflies is low and slow they are very easily caught in a hand net.

A great variety of preparations have been recommended for killing the worms, many of which have no value whatever. The great difficulty is to find a substance that will destroy the insects without injury to the plant. In this respect nothing has been found superior to the California Buhach or Pyrethrum powder, manufactured by Milco & Co. The only objection to this is its costliness. It may be diluted. however, with from two to five parts of flour or air slacked lime, and should always be applied in the evening, as the volatile properties of the powder are not so quickly dissipated at night as they are by the light and heat of the sun. A mixture composed of one part cayenne pepper, two parts sulphur, and three parts air-slacked lime, has been found to do good service. Kerosene emulsions are good, but should be used with care, and followed shortly by a thorough drenching with pure water. A number of formulas for the preparation of these emulsions have been given, of which the following is as good as any: Kerosene, one pint; skimmed milk three pints; water five pints. The kerosene should be first thoroughly mixed with the milk by vigorous shaking or stirring, after which the water may be added. This is one of the most reliable applications ever discovered for all kinds of bark-lice and scale insects. Small cabbage patches may be saved from destruction, by constant care and attention, but in large fields, that are raised for the city markets, it is almost impossible to fight the worms successfully. The consequence is that cabbage is very scarce in these markets and the price per head three or four times as much as it was a few years ago. There is reason to hope, however, that nature will come to the rescue of the cabbage grower before long, in the shape of parasites or some insect malady. Of the latter, there is indeed already indication. In the January number of the American Naturalist, Prof. Forbes gives an account of a disease which carried off large numbers of the latter broods of worms in Illinois, and Prof. Riley has also observed among them what he calls "black rot." We can but hope that it will prove epidemic.

THE COLORADO POTATO BEETLE.

This once destructive pest has scarcely "put in an appearance" throughout the west for the last year. Entomologists have not decided to what agencies to attribute its remarkable scarcity, but whether due to peculiarities of the season, to the multiplication of natural enemies or to the prevalence of some disease which escaped observation, its absence was a great boon to the potato grower.

THE CODLING MOTH. (*Carpocapsa pomonella*, *Linn.*)

The apple crop was unusually short and of poor quality throughout the northwest during the past summer, and there was great complaint of the "apple worm" by which, in ninety-nine cases out of one hundred, is meant the larva of the above named moth. No apple grower or apple eater needs an introduction to the fat, pinkish-white larva with black or brown head, which so often takes the fairest fruit upon the tree and gives to cider a more than desirable richness, unless the apples are assorted with the utmost care, and necessitates so much extra labor on the part of the housekeeper in preparing "apple sauce." The parent of this worm is so shy that it is seldom recognized even by those who suffer most loss from the gnawings of its progeny. It is a small and beautiful species of moth of a gray color, with numerous wavy stripes of bronze crossing the wings, and a large spot of burnished bronze near the tips. It cannot be allured by lights or sweetened fluids, and is seldom seen by daylight. It lays its minute yellow eggs in the blossom end of the fruit and as soon as the worm hatches, it commences to bore toward the core. The first brood of moths appears just as the apples are setting, and the second when the latter are half or two-thirds grown, and there are premature or belated individuals that keep up a constant succession. The first brood of worms seldom accomplishes more than a beneficial thinning out of the fruit, but the second brood is often ruinous to the crop. The remedy is therefore to trap the first brood of larvæ after they leave the fruit, and prevent in a measure the occurrence of the second brood. This is done by means of bandages of hay, rags or paper, which should be put around the tree about the last of May and kept on till the last of August. They should be regularly examined every two weeks, and all worms or cocoons found concealed in them crushed or otherwise destroyed. Several prominent fruit growers have lately adopted the plan of syringing their apple trees with Paris green or London purple in water by means of a force pump and hose with a spraying nozzle. If this is done three or four times during the summer it is claimed that it will prevent the moths from laying their eggs. About a tablespoonful of the poison should be used to a gallon of water. In small orchards the bandage traps are a less expensive and less troublesome preventive.

THE APPLE CURCULIO. (*Authonomus quadrigibbous*, Say.)

A few weeks ago our President, Mr. Harris, wrote me concerning a grub in apples, which he took to be the above named curculio. As this insect is sometimes quite injurious to apples, a few words of description may be devoted to it. It differs from the plum curculio in its somewhat smaller size, its longer and more slender beak, or snout, and in its habit of going through all its transformations *within the fruit.* It is of dull gray and brownish colors, with four rust-red humps or projections on the hinder part of the body. Its punctures in the apple, both for food and for the reception of its eggs, have been compared to those made by a red-hot needle, as they are always rimmed with black. Like the more common apple worm, its larva, which is a humpy and wrinkly little grub, works around the core of the apple, after a time changing to a translucent white pupa from which, in a short time, the beetle emerges and cuts its way out of the fruit. As this species breeds but once a year it is never likely to do such extensive damage as some other apple worms. It can be kept in check by jarring the beetle from the trees in the summer, and by gathering and destroying the infested fruit.

THE GRAPE VINE FLEA BEETLE. (*Graptodera chalybea*, Illig.)

The foliage of grape vines suffered severely last spring from the gnawings of this handsome but destructive little bettle. It commences its work in the spring on the leaf and flower buds, often cutting off a large proportion of the latter. It also lays its orange colored eggs in clusters on the underside of the leaves, and before the beetles have entirely gone the larvæ begin to hatch. The latter are of a yellowish or brown color, dotted and striped with black and have black shining heads. They are very voracious and riddle the leaves with holes. In about three weeks, having completed their growth, they drop to the ground into which they burrow to the depth of one or two inches and change, in an earthen cell, to golden colored pupæ, from which in two or three weeks the beetles appear. The process of reproduction again takes place, the beetles from this second brood of larvæ being the ones which hibernate. This is a very hardy insect and difficult to destroy except by the severest measures. The most effectual plan for getting rid of it is to jar the first beetles that appear in the spring into cloths spread under the vines and saturated with kerosene. The beetles are most sluggish on cool mornings and will drop readily, and the slightest touch of kerosene kills them. The larvæ may be killed by a much diluted emulsion of kerosene or by syringing the infested leaves with paris geeen in water, in the proportions of a teaspoonful of the green to a gallon of water.

THE GRAPE BERRY MOTH. (*Eudemis botrana*, Schiff.)

A considerable proportion of grape rot in some vineyards is caused by the workings of the small, slender, greenish larva of this moth. The grapes infested may first be distinguished by having a discolored spot on one side around the open center of which there is often a slight deposit of excrement. The worm works in the centre of the grape and often devours some or all of the seeds. If one grape does not suffice, it works its way into a second, often from mere destructiveness as it would appear; webbing together and spoiling four or five. When the larva is full grown it leaves the fruit and proceeds to the leaves. Here it neatly cuts out a portion of the leaf for a flap, which it folds over itself and fastens down firmly by the edge. This ingeneously constructed retreat is lined with silk and within it the larva changes to a chrysalis and in this state passes the winter. The moth appears in the spring. It is very small, the expanded wings measuring about four-tenths of an inch. The forewings are of a bluish, leaden color ornamented with dark brown spots and bands. The body is olive brown and the hind wing dark gray with paler fringes.

Miss M. E. Murtfeldt has discovered that in Missouri the first brood of larvæ feed in the tender leaf buds of the Ironweed (*Vernonia*) and are never found on the grape. By the time the moths from this brood emerge, the grape berries are well formed and the moth deserts the Ironweed and selects these as food for her young.

The only way in which this insect can be kept in check is to gather and destroy the infested grapes and to burn the leaves in which the pupæ are concealed late in the fall. It might also be advantageous to exterminate all the Ironweeds growing in the vicinity, in the spring.

THE STRAWBERRY LEAF-ROLLER. (*Phoxopteris fragariae* W. and R.)

This is a very wide spread foe of the strawberry plant and often occurs in such numbers as to ruin the beds. The larvæ are found within the folded leaves about the time that the berries begin to ripen. They are about one-third of an inch long when full grown, of a greenish or yellowish brown color with a horny mahogany brown head and a shield of the same color on top of the first point of the body. The golden brown chrysalis is formed within the folded leaves. The moth is about the size of the grape berry moth. The forewings are of a reddish brown color handsomely ornamented with dark brown, black and white. There are two broods each season, the second of which hibernates within the folded leaves in the chrysalis state. It is almost useless to attempt to reach this insect with either powders or liquid applications, so securely is it hidden within the webbed and folded leaves. The best preventive of its injuries is to frequently change the location of the strawberry beds. Mr. Gibbs writes me that he obtained the mastery of it by salting and plowing under the worst infested fields. He has also observed that many of the chrysalids are destroyed in the early spring by birds which search for them through the mulching.*

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*See Secretary's Portfolio, for a note on this insect.

THE STRAWBERRY SAWFLY. (*Emphytus maculatus*, Norton.)

This pest of the strawberry plant has also been brought to my notice by Mr. Gibbs, for whom it did much injury last spring on a new bed of the Wilson variety.

The larva of this sawfly is a slender, semi-transparent green slug worm about three-fourths of an inch long which when not feeding rests coiled up on the under side of the leaves. When mature these slugs burrow into the ground to the depth of an inch or so and form a frail cocoon of silk and particles of earth. The flies appear late in July and lay the eggs from which the second brood of slugs hatch in August. This insect is not so common as many other enemies of the strawberry, but is sometimes very destructive. It is however, easily killed with hellebore applied dry or in water. Paris green in liquid suspension may also be freely applied to the second brood in August.

In concluding this paper, I wish to say that ill-health and business demands make it impossible for me to make extensive investigations of the insects occurring in distant parts of the state, but I shall always be glad to have my attention called to them by correspondence, and would suggest that where inquiries are made concerning any species, that specimens of the insects be packed in tin or wooden boxes to accompany the latter.

DISCUSSION OF THE ENTOMOLOGICAL REPORT.

Mr. Latham. There is a steel blue beetle that eats into the buds of the grape. I would like to have it reported on at some future time by our entomologist. As to insecticides, white hellebore is effective if pure.

Mr. Whipple. Only one kind of cabbage worm is treated of in the report. There is another, a long worm, with bright stripes.

Mr. Mendenhall. I think the characteristics of one kind are largely the characteristics of all the rest.

Mention was made by some member, whose name the reporter did not hear, of a new potato bug that threatens to be destructive in Dakota.

Secretary Gibbs. From the description given I presume it is the same bug that Mrs. Underwood mentioned at our meeting in June, 1882, as appearing on her flowering plants. It is a long, slim, blue-black, genteel-looking, piratical fellow, that comes suddenly, eats voraciously, and disappears quickly. I have seen them attack a patch of mangel wurzel beets and riddle the leaves, by swarms, in one day ; but a weak solution of paris green lays them out expeditously. It has no such adhesiveness and tenacity as the Colorado potato beetle, and does not threaten to be generally prevalent. I will look it up in the books and identify it in the Secretary's Portfolio, if I can.

Mrs. Sargeant being present was then invited to read her paper.

A BEGINNING IN SILK-WORM CULTURE IN MINNESOTA.

By Mrs. H. B. Sargeant, Lake City.

Finding myself in possession of some silk-worm eggs in the spring of 1883, I thought the proper thing to do would be to allow them to see the light, and enjoy the term of life allotted them on this mundane sphere. As I had no acquaintance with them, never having seen a silk-worm, I began to look around for some instruction as to the way and manner in which I should receive and entertain my expected guests. I soon found that a book giving instruction on this subject was published by the Woman's Silk Association, at Philadelphia. I procured the book and was enabled to provide for their comfort when they arrived.

The food of silk-worm is the mulberry. Of the mulberry there are said to be some seven or eight varieties. As a vegetable production it is said to be entirely subservient to the wishes of its producer. It will, under favorable circumstances, grow to the height of forty or fifty feet, or, it can be trained as a tall and ornamental shrub or dwarfed to a thick and impenetrable hedge.

It was about the 7th of July last, when the mulberries which had been started the year before promised a supply of food, that I brought the eggs from the cool temperature of 40° and placed them in a room with a temperature between 75° and 80° of summer heat. Just here I would say that the room for these little silk producers must be perfectly neat and clean, free from odors, with pure air and plenty of light. The eggs may be placed upon tables or shelves and over them a piece of tarlatan or mosquito netting. As soon as they commence to hatch, which may be within twenty-four hours, have ready some mulberry leaves, young and tender, finely cut with a chopping knife. Sprinkle these lightly over the netting.

Immediately on coming from the shell the little worms, less than a quarter of an inch in length, look around for food ; finding which, they remain nearly stationery, never moving save in search of it. Once every day, to take away the dried leaves and the litter which accumulates, a fresh piece of netting is spread over the worms and upon it freshly cut leaves. In an hour or more the worms will have crawled up through the netting, and the remains of yesterday's food can be removed.

The worms hatched each day must be kept by themselves. After the third day, the worms are said to be weak and feeble and not worth raising. The little worms must be fed as often as once in two or three hours. The amount they eat depends largely upon the temperature of their room. If the temperature goes below 75° they eat but little, and if they do not eat they will not spin silk sufficient to make themselves a decent shroud.

As the days are added to their age so their food must be increased. Their whole life is less than forty days; and during the last two weeks they devour an enormous quantity of food, considering their size. As the amount of their life's work depends upon the quantity of food consumed, together with the temperature in which they are kept, they have been known to have finished this work in twenty-five days. Generally, they live from thirty to thirty-five days. In their living and eating and changing of clothing they do not differ from other species of the same class which we instinctively shrink from in dismay.

But these creatures we treat differently. Plenty of food and the best of care are not grudged them; for it is the last act of their short lives which is the most wonderful of all. The worms, when first hatched, are nearly black. In about five days they shed this skin and appear in a lighter one. This change of skin occurs at intervals during their lives. Each time the skin is lighter than the preceding one. After the last change the worm is of a pearly whiteness, and smoother to the touch than the finest satin that comes from the looms of the silk weavers. It is also nearly transparent. The food has been converted into silk fluid and is ready to be spun. The worm at this stage is from three to four inches long.

The time has come when the fresh green leaves have no attraction for them. They move their heads from side to side and appear to be looking for something. That something is a place upon which to build their tomb.

Wisps of straw or bunches of twigs are laid upon the tables. The worms soon find them, and crawl up till, finding a suitable place they attach to numerous twigs threads to support the cocoon. Then the worms begin to spin the continuous silken thread which forms their precious little nests. They arrange the thread all around the body, describing ovals with the head. In a few hours they are surrounded with a thin gauze of silk, through which they can be seen working for dear life or death, which? After a few hours more the worms have completely hidden themselves from view; the threads have been woven thick and close, over and over each other, until the gathered treasures of their short lives have been expended. They fold themselves within their beautiful winding sheets and wait the life beyond.

A worm spends three or four days in spinning its cocoon, though all do not commence spinning at the same time. Some are longer in finding a good place, others, having found a place and made a beginning, fall back on the table, and are obliged to start anew. It is very interesting to watch them at their work. They do not seem to be exempt from the trials and perplexities of more intelligent creatures.

Four days after the last cocoons have been spun they must be gathered. The firmest and best are placed in a partially darkened room; and the others, which are to be reeled for silk manufacture, are placed for about 30 minutes in an oven sufficiently warm to stifle the chrisalides. When this has been accomplished, the cocoons are placed upon tables to dry or are immediately reeled into skeins and made ready for the looms or other uses to which the silk is applied.

The imperfect cocoons together with the floss silk which surrounds all the cocoons, are carded and spun at factories and mixed with wool fabrics. The worms which produce white cocoons are the best; the silk is stronger and has more lustre.

Now, to return to the worms, which we left in the darkened room. In from 12 to 15 days the chrysalis will put aside the silken fibres of its tomb, and come into the world a full-grown miller. The silk-worm miller is of a creamy whiteness, and measures nearly an inch and a half across the wings from tip to tip.

Male and female they arrive here as in the days when God created the first pair. Equal in size they seem to be equal in intelligence, with the same duties, privileges and responsibilities. Therefore, it is presumable that they are equal suffragists.

When the females are ready to deposit their eggs they are placed upon small pieces of cloth or paper, about five inches square. The number of eggs deposited is from seven to eight hundred. The eggs laid the first three days only are good. After that time the millers may be thrown away. The eggs must be kept in a cool, dry place, safe from mice, spiders, and the like, till another summer brings the mulberry leaves.

I have thus far related my short acquintance with these little creatures. I hope another year to make a closer study of their manners and customs.

Silk culture is a very ancient industry. The Chinese claim the honor of the discovery of the silk worm and of the subsequent utilization of its fibre. I must particularize and add, that the mode of raising and feeding the worms, and the different processes of converting the fibre into cloth, was a spark from a woman's brain. Also that the princesses of royal blood, and ladies of noble families only, were allowed to raise the worms and weave the queenly fabrics.

In eastern countries, where the industry has been carried on for many centuries, the women and children care for the worms, reel the silk, and prepare it for the looms. About fifty years since, silk culture was attempted in this country, but for some reason it proved a failure. Statistics show that $15,000 worth of raw silk is consumed annually by the home market, nearly all of which is of foreign importation.

The silk industry does not require an expensive outlay. The mulberries can be grown in hedges and be made to occupy a comparatively small space. The trees can be furnished by any nurseryman and the silk-worm eggs are easily procured. The Woman's Silk Culture Association furnish books which give complete instructions for raising the mulberry and for educating the worms; also for reeling the silk and preparing it for market.

The reeling of the silk is considered of the utmost importance. In countries where the silk industry is extensive, silk-reeling is sometimes conducted as a separate business. The Woman's Silk Association at Philadelphia offer two kinds of reels—one made of ood for $20, another made of metal and complete in all its appointents for $65. The reeled silk brings from $4 to $7 per pound, according to its grade. I am unable to give very exact figures with regard to prices and profits; but the whole year's labor, leaving out the reeling, could be finished within fifty days, so that if the profits were not immense the labor would have been in proportion.

Now as a woman originated the industry, as women have hitherto, in the old world, carried it on, American women can continue the work. Women of means might establish filatures for reeling and factories for the weaving of silk in towns and cities, and many women and children who can perform only light labor can spend their time pleasantly and profitably in rearing silk-worms.

Col Stevens moved that a vote of thanks be tendered to Mrs. Sargeant for her interesting and practical paper, and that, as in the case of Miss Manning, we elect her an honorary life member, and that she be invited to favor the society with reports of her continued experiments in silk worm culture.

The motion was unanimously adopted.

Samples of cocoons grown by Mrs. Sargeant were distributed among the audience.

A member asked, have we the mulberry that Mrs. Sargeant speaks of as the proper food for the silk worm?

Several answered, yes—the Russian Mulberry.

R. Porter. Can the Russian mulberry be fruited in Minnesota?

Col. Stevens. Yes, in three years. It grows readily from cuttings.

Mr. Emery explained the habits of growth of the mulberry by a diagram on the blackboard. It is now being planted in the Northwest by the million, and will supply an unlimited amount of food for silk worms, as well as a really desirable fruit for family use.

Secretary Gibbs then presented the following:

REPORT OF DELEGATE TO THE AMERICAN POMOLOGICAL SOCIETY.

Mr. President and Fellow Members:

At the time of my appointment as delegate, on the 8th of August, the Executive Committee had before them an estimate of four hundred dollars as the probable maximum expense of the collection and exhibition of our fruits; and with this estimate in view I was authorized by unanimous vote of the committee, to make the display as complete and creditable as the time, the condition of the fruit crop and the funds at disposal would allow.

The following is the expense bill:

Collecting and forwarding fruits at home	$ 83.84
Expenses to Philadelphia and return	147.50
Cash paid J. T. Grimes, time and expenses on grapes	28.45
Time in collecting fruits, August 8th, to September 7th	80.00
Use of team	20.00
Total	$359.79

This bill has been approved by the Executive Committee and paid by the treasurer.

As appears elsewhere in the proceedings of the Executive Committee and in the report of the treasurer, two hundred dollars of this outlay was contributed by the Governor from his contingent fund, leaving the cost of the representation of our society at Philadelphia and the exhibition of the fruits, $159.79 to the regular funds of the society.

A survey of the condition of the fruit crop in the state, made previous to the meeting of the committee, showed that, disasters excepted, a few specially favored localities could be depended on for a good collection; but at the same time it was further apparent that, notwithstanding the promise of the spring, it was the off year for apples in Minnesota, as it was almost everywhere else, and if the fruit to be taken to Philadelphia was to be anything like a general representation of the large list of varieties grown, it must be collected by a careful and laborious search in several counties. Circulars calling for fruit and for information as to where it could be obtained, were immediately printed and sent to the state press, members of the society, and others, and from the time of my appointment to the 7th of September, when I was obliged to leave with the fruit for the east, my entire time was devoted to the getting up of the collection. Some promising localities were left unvisited for want of time, and some of our best and handsomest varieties, especially new seedling apples, were left behind for want of time to go after them. As it was, I succeeded in getting together about twelve bushels of apples representing about one hundred and forty distinct varieties, without including a single one that was inferior, and, with the assistance of J. T. Grimes, who attended mostly to that matter, about thirty kinds of grapes, and a few native plums. The plan pursued was to first ascertain where the fruit could be obtained, put the early sorts already mature, into the best condition to resist decay, leave the later sorts ripening to the last moment on the trees or vines, then go and gather them up and hurry them through to the rendevouz with all possible dispatch and care. The specimens of apples, numbering from three to four thousand in all, were each wrapped in single papers, and wherever necessary to insure identity, each variety group was reinclosed in separate paper bags. The grapes and plums were laid in cotton batting, and packed in baskets by themselves. Success in showing fruit in public exhibitions, where you get into the hands of competent judges, depends very largely upon condition, which governs the appearance of each sort and the general expression of the whole. This also depends upon judgment as to the proper time to pick each sort and upon the utmost delicacy in handling, and afterwards close packing for transportation. There are so few growers who realize all this fully, that it is useless to touch a collection sent in, as a rule, by growers. It must be picked, packed and transported by experts. Much that was sent me was entirely off condition before it reached Lake City, and of course had to be rejected. Some fruitless journeys were made. It was not enough to find the variety one was looking for ; if the one in hand was not probably the best sample of its sort to be found, then the search must be continued. This in the off year was laborious and expensive. But there were other journeys made to places where there was little expected, that turned out rich in fruits and in points of valuable information, which the society will get the benefit of in one way and another.

I will stop and say right here that we little know what mines of wealth are to be found in the experiments that have been made in fruit growing in various parts of our state by farmers and others who have heretofore had no visible connection with our society, especially in the production of seedlings and in the importation and trial of foreign sorts. Some of these mines have been or will be opened at this meeting.

In presenting the following list of contributors and their fruits, it is but an act of simple justice for me to make mention of the two leading growers of the apples and the grower of the Minnetonka grapes. Underwood & Emery, of Lake City, turned me loose in their orchards of perhaps 3,000 bearing trees, and left me to sample up without limit. Charles Ludluff, of Carver, not a nurseryman, but a plain farmer, did substantially the same. This man probably grows more varieties of apples than any other person in the state not a nurseryman. I think in a favorable season for fruits we could draw on him for over one hundred sorts of apples and almost no end of grapes, cherries and plums. A. W. Latham, of Excelsior, who grew the best grapes of our collection, having a very favorable location, gave his vineyard extra care with special reference to filling out this department of our exhibit. Without these three contributors the success our effort achieved would have been impossible. Others did the best they could, and are entitled to full credit and the thanks of the Association.

I ought also to mention the Rochester fruit growers. Their place is blank in the list. Their extensive orchards were not all in the direct line of the tornado of August 21st, but the flanking gales of it so prematurely harvested and bruised all their apples that after careful search there and elsewhere in the vicinity, in company with Charles Gibb, of Canada, who was in quest of the Russian fruits, I could not find a single specimen of any variety of apples fit to show. So great had been the destruction and injury to fruits in and around Rochester that I was applied to by the Secretary of the Southern Minnesota Fair Association of that city to furnish a collection of apples to supply the deficiency in that section for their fair, the second week in September; and on the eve of my departure for Philadelphia I shipped to him, to be turned over to and exhibited by Mr. Sias, something over a barrel of carefully wrapped specimens embracing over fifty varieties of apples, fresh picked and perfect, including a set of entries of my own growing and duplicates of the Philadelphia collection, and directed Mr. Sias that the premiums awarded, if any, be donated to the Association.

The Rochester fruit growers, in a favorable season, will come in with a very large list of varieties, many of them novelties not to be found elsewhere. In all Minnesota collections of fruit got up at present, there will be vacant chairs that must be regretfully noticed, when we do not find the names of Sias and Jordan, and looking down the list also we fail to discover the name of that other veteran of the apple fairs, and winner of premiums on big collections, J. S. Harris, of La Crescent. His Bailey Sweets, his Seeknofurthers, his Jonathans, his Northern Spys, you shall not find them in the list, not even their names, though you search for them carefully and with tears. Like Antony, in his oration, I want to pause and weep to think of the Wilder medal coming to Minnesota without an apple in the lot from him. During his searches of apples for the State Fair, his reports to me were so discouraging from the southern and southeastern parts of the State that I did not deem it worth while to visit these sections.

It would be interesting to know how many varieties of apples are fruiting in this State. Our people have come from all quarters of the globe. The most of them have brought their favorite varieties with them, and of almost every sort planted there is some survivor. In an apple year I think we could find three hundrd sorts, and possibly twice that number, if we include unnamed seedlings.

The following is a list of

CONTRIBUTORS AND THEIR FRUIT.

APPLES.

Underwood & Emery, Lake City.

Dutchess.
Yellow Transparent.
Tetofski.
Pickett's No. 5.
Conical.
Roman Stem
Scott's Winter.
Beecher Sweet.
Peach Apple.
Orion.
Hyslop.
Hesper Blush.
Drake.
Alexander.
Fameuse.
Meader's Winter.
Russian No. 161.
“ 565.
“ 984.
Wealthy.
White Astrachan.
Moscow.
Plumb's Cider.
Odell's Seedling.
Smith's Favorite.
Jewell's Sweet Banana.
Jewell's Red Winter.
Deomia.
McIntosh Red.
White Winter.
Homestead.
Talman Sweet.
Quaker Beauty.
Utter.
Russian No. 410.
“ 985.
“ 978.
Early Strawberry.
Whitney No. 20.
Orange.
Fameuse Crab.
Bailey's Crimson.
Northfield Beauty.
Boomer Crab.
Sweet Russett.
Fall Orange.
Walbridge.
Gideon No. 7.
Haas.
A. S. Winter.
Price's Sweet.
Russian No. 413.
Russian No. 968.
Minnesota.

Geo. Bartron, Lake City.

Angular.
Maiden Blush.

Charles Gould, Central Point.

Duchess.
Haas.
Orion.
Wealthy.
Transcendent.
Plumb's Cider.

Baker Harrison, Central Point.

Hass.
Fameuse.
Utter.
Price's Sweet.
Talman Sweet.
Plumb's Cider.

R. L. Cottrell, Dover Center.

Duchess.
Sops of Wine.
Hyslop.
Meader's Winter.
Hutchison's Sweet.
Haas.
White Pigeon.
Transcendent.
Maiden Blush.
Charlamoff.
Talman Sweet.
Orange.
Lady.
Pear Apple.
Fameuse.
General Grant.
Cherry Crab.
Tetofski.
Russian Unknown.
Red Astrachan.

Sidney Corp, Hammond.

Duchess.
Elgin Beauty.
Anis.
Wealthy.
Rollins' Pippin.
Rollins' Russet.

G. A. Cook, Cook's Valley.

St. Lawrence.
Seedling Apple.

Charles Ludluff, Carver.

Peffer's Sweet.
Hyslop.
Boyce.
Duchess.
Akin's Green Winter
Grimes' Winter.
Pewaukee.
Yellow Siberian.
Briar's Sweet.
Montreal Beauty.
Barkeeper.
Summer Sweet Crab.
Russian No. 385.
" " 565
" " 585
" " 978
Greenwood.
Winsted Pippin.
Gen. Grant.
Orion.
Sylvan Sweet.
Allen Crab.
Rollins' Prolific.
Ashfieldt.

Robinson's Seedling.
Plumb's Cider.
Russian No. 984.
“ “ 563
“ “ 387
Early Strawberry.
Orange.
Northfield.
Minnesota.
Minneapolis.
North Star.
Rollins' Pippin.
Sweet Russet.
Maiden's Blush.
Quaker Beauty.
Rembacker.
Dahlgren.
Minn. Stripe.

Peffer's No. 1.
Malinda.
German Rambo.
Russian No. 378.
“ “ 762
Cinnamon Crab.
Lake Winter.
Wetsig's Winter.
Transcendent.
White Pearmain.
Haas.
Coral Crab.
Horst.
Molly.
Wealthy.
Gibb Crab.
Whitney No 20.

F. W. Miller, Lake.

Duchess,
Conical.
Fall apple, name unknown, a Russian.

Wealthy.
Minnesota.
Plumb's Cider.
Walbridge.

John Fletcher, Lake City.

American Golden Russet.
Talman Sweet.

Yellow Muscovite.

J. C. Stout, Lake City.

Talman Sweet.

G. M. Dwelle, Lake City.

Red Astrachan.
Transcendent.
Fameuse Crab.
Duchess.
Virginia.

Ben Davis.
St. Lawrence.
Quaker Beauty.
Hyslop.

G. W. Fuller, Litchfield.

Wealthy.
Duchess.

Beecher Sweet.
Transcendent.

W. J. Hahn, Lake City.

St. Lawrence.
Plumb's Cider.
Perry Russet.

Golden Russet.
Ben Davis.
Saxton.

M. C. Bunnell, Newport.

Duchess.
Hyslop.
Transcendent.
Wealthy.
Utter.

W. E. Brimhall, St. Paul.

Duchess.
Gideon Crab.
Wealthy.

Dr. C. W. Crary, Lake City.

Perry Russet.
Unknown winter apple.

Oliver Gibbs, Jr., Lake City.

Duchess.
Walbridge.
Belvidere.
Whitney No. 20.
Orange.
Moscow.
Maiden Blush.
Wealthy.
Minkler.
Talman Sweet.
A. S. Winter.
Transcendent.
Early Srawberry.
Price's Sweet.
General Grant.
Utter.
Haas.
Conway Sweet.
Hyslop.
Beecher Sweet.
Quaker Beauty.
White Astrachan.

Mrs. Cutler, Central Point.

Fall apple, name unknown.

John Benson, Lake City.

Utter
Fall apple, name unknown.

Samuel Doughty, Lake City.

Seedling Winter apple.
American Golden Russet
Perry Russet.

Geo. Patton, Lake City.

Two varieties seedling apples.

A. W. Fountain, Frontenac.

Two varieties seedling winter apples.

Wm. Forster, Chatfield.

Forter's Red Winter.
Winter Sweet.
Fall Seedling.

Andrew Peterson, Waconia.

Russian No. 70, Winter Pear.
" " 262, Charlamoff.
" " 410, Little Seedling.
Russian No. 240 Lieby.
" " 378, Hibernal.
" " 472, Ostrekoff Glas.

GRAPES.

R. Knapheide, St. Paul.

A number of varieties of grapes—names lost or mislaid.

B. Rueideger, Carver.

Eumelan.
Moore's Early.
Northern Muscadine.
Massasoit.
One variety not named.
Delaware.
Morning Pride.
Talman.
Seneca.

A. W. Latham, Excelsior.

Concord.
Talman.
Rogers No. 3.
Black Hawk.
Brighton.
Cottage.
Eumelan.
Perkins.
Roger's No. 9.
North Carolina.
Lady.
Worden.
Iona.
Delaware.
Telegraph.
Rogers No. 15.
Moore's Early.
Hartford Prolific,
Roger's No. 39.
Janesville.

PLUMS.

Underwood & Emery, Lake City.

De Soto.
Weaver.
Forest Garden.

Charles Ludluff, Carver.

Native plums—number of sorts unknown.

R. Knapheide, St. Paul.

Native plums—number of sorts unknown.

Recapitulation of Varieties of Apples.

Alexander.
Akin's Striped Winter.
Maiden Blush.
Montreal Beauty.

Anis.
Akin's Green Winter.
Allen Crab.
Ashfield.
Angular.
Beecher's Sweet.
Bailey's Crimson.
Boomer.
Boyce.
Briar's Sweet.
Barkeeper.
Ben Davis.
Belvidere.
Charlamoff.
Conical.
Cherry Crab.
Coral Crab.
Conway Sweet.
Duchess.
Drake.
Deomia.
Dahlgreen.
Early Strawberry.
Elgin Beauty.
Fameuse.
Fameuse Crab.
Fall Orange.
Forster's Red Winter.
“ Sweet.
“ Fall Seedling.
Gideon No. 7.
General Grant.
Grimes' Winter.
Greenwood.
German Rambo.
Gibb Crab.
Golden Russet.
Gideon Crab.
Hyslop.
Homestead.
Haas.
Hutchinson Sweet.
Horst.
Hesper Blush.
Jewell's Sweet.
Jewell's Red Winter.
Lady.
Lake Winter.
Minnesota.
Minneapolis.
Minnesota Stripe.
Malinda.
Molly.
Minkler.
Northfield Beauty.
North Star.
Orion.
Odell.
Orange.
Pickett's No. 5.
Plumb's Cider.
Price's Sweet.
Peach apple.
Pear apple.
Peffer's Winter.
Peffer's Sweet.
Pewaukee.
Peffer's No. 1.
Perry Russet.
Quaker Beauty.
Red Astrachan.
Roman Stem.
Rollins' Russet.
Rollins' Pippin.
Robinson Seedling.
Rembacker.
Scott's
Smith's Favorite.
Sweet Russet.
Sops of Wine.
St. Lawrence.
Summer Sweet.
Sylvan Sweet.
Saxton.
Talman Sweet.
Transcendent.
Utter.
Virginia.
Wetsig's Winter.
Wealthy.
White Winter.
Whitney No. 20.
Walbridge.
White Pigeon.
Winstead Pippen.
White Pearmain.

Meader's Winter.
Moscow.
McIntosh Red.
Yellow Transparent.
" Muscovite.
" Siberian.

RUSSIAN APPLES—AGRICULTURAL DEPARTMENT LIST, 1870.

No. 70.
No. 161.
No. 240, Lieby.
No. 262, Cahrlamoff.
No. 385.
No. 388, Hibernal.
No. 410, Little Seedling.
No. 413.
No. 472, Ostrekoff Glas.
No. 563.
No. 565.
No. 584.
No. 585.
No. 962.
No. 968.
No. 978.
No. 985.

Unnamed seedlings and unknown varieties, about 20.

Fortune favored us in every respect from the time our fruit left Lake City till the exhibition was done. The fruit arrived at Philadelphia promptly and in good condition. I could not help comparing this good luck with the misfortune of some other exhibitors from distant points, who spent a good share of their time running to the express offices and back and telegraphing to hear from their fruit, which arrived only by piecemeal, when it did come, and some packages not at all, and some in broken packages and in bad order. Ample room had been reserved for our display by the Pennsylvania Horticultural Society in their spacious hall, by whom also an abundance of plates and dishes, both great and small, was supplied, together with all the help needed to put it up. A bushel each of the Duchess and Wealthy was placed side by side at the centre of the main table assigned us, and the rest of the apples were so arranged so as to give the best effects as to contrast in color, and ranging in size from the larger ones at the center down to the crabs, through all their gradations, to the ends of the tables. The grapes and plums occupied a side table near by. Over all were hung printed placards bearing the words :

Minnesota ♦ State ♦ Horticultural ♦ Society.

140 Varieties of Apples and 30 of Grapes.

and among the plates were placed the names of all the growers and their post office addresses on smaller cards. These cards were all picked out and carried away by the visitors.

The grapes were not fully ripened, owing to slow growth in the extraordinary cold summer of 1883, and many of the apples came short of their full beauty of color for the same reason, having been picked, some of them two to six weeks before maturity ; but upon the whole, with the large size, perfect form, bright, healthy look of all the fruit and the perfect finish and color of such sorts as were fully ripe, the collection was very beautiful, and established in the minds of all beholders the unrivalled adaptation of our Minnesota soil and climate to the production of the northern fruits in their highest excellence. Let me not be misunderstood here. I did not exhibit these fruits with any claim that the varieties of trees producing them were all hardy and profitable; I was careful to represent the facts as they are—that we have as yet among all the sorts we are fruiting but few really hardy ones; but I felt proud to show, and it was a great satisfaction there to pomologists to learn, that we had this much of certainty in our fruit growing, beauty and quality, and that these great requisites to profitable horticulture were to be seen to the best advantage in our very hardiest sorts, such as Duchess and Wealthy. I think the Duchess exhibited in this collection were the finest in color, I ever saw. There was nothing approaching them in beauty in the entire exhibition of apples. And the Wealthies wanted nothing but a little more time in orchard to paint and varnish their faces in the autumn sun to be the superiors in beauty of their earlier ripening neighbors, the Duchess.

One thing familiar enough to us, but seemingly new to the visitors at this exhibition, was the fact that we had got so much of the quality of the apple into our little crabs, in our experiments in fruit growing out here in the West. Our Whitneys No. 20, our Early Strawberry, our Beecher's Sweet, Briar Sweet, Sylvan Sweet, Sweet Russet, Angular, Orange and many others were a surprise to them. Having abundance of samples it was an amusement to note the pucker in the mouths of committees and visitors, which the sight or touch of a crab would give them, from their idea of crab quality, and then take it out and substitute the astonished and satisfied expression that followed the tasting of a Whitney, a Beecher Sweet, a sweet Russet or an Angular crab. There were many novelties on the table, found in the search for these fruits—varieties heretofore unknown to this society—new seedlings

—Russian Apples, etc., etc. I will not take time to describe them here. They will come in for notice elsewhere in our proceedings.

The result of the exhibition was that we were accorded by unanimous judgment of the committee the honor of having the largest and best collection of apples at the meeting and awarded the Wilder medal on our general collection of fruit.

The Duchess apples of the central stack were selected by a committee of the Pennsylvania Horticultural Society and entered by them and awarded a first premium on their part in the name of Charles Gould, of Central Point, who grew the best ones; and the same committee also entered our grapes and gave them their second premium offered for best twenty varieties in cut bunches in the name of A. W. Latham, of Excelsior.

In regard to the proceedings and discussions of the American Pomological Society, the meetings being held in a room separate from the exhibits, I only attended to those portions that I deemed of most interest to the West, but spent the most of my time where I thought I could do the most good, at the tables of our fruit. The hall was constantly thronged with visitors, day and evening for three days—the Minnesota fruit was an object of great interest, and though as in all such places, there is considerable repetition in the information imparted, as with a lecture on wax works and things, I did not regret the time or the effort. I was a representative of the State for the nonce, and of the Northwest, too, for that matter, and did what I could for it. Opportunity was found in the debates, however, to place our Wealthy and some others of our best varieties of fruits fairly upon the record, and at the banquet which closed the meeting, and which was given to the American Pomological Society by the Pennsylvania Horticultural Society, your delegate in responding to the toast assigned him "The Pomology of the Northwest," gave the outlook of the fruit interest of a somewhat larger territory than our State alone, but of a part of which at present, certainly that part of it to the Northwest of us, we are the headquarters and the source of light on the subject.

The points of principal interest in the debates will be carefully abstracted and furnished for our annual report, together with various items of information in horticulture obtained in the extension of my trip to Washington, and to the New York experiment station at Geneva, and I will print also the final resolutions of the meeting and the new rules of the American Pomological Society to govern future exhibitions, to which they desire to invite special attention of kindred societies. To the resolution which relates to hospitalities, I desire to add on my own account the warmest acknowledgments you can think of, to the members of the Pennsylvania Horticultural Society and to the citizens of Philadelphia, for the many courtesies received. The half days carriage ride about the city, the visit to the public buildings, the art galleries, the Central Park and Girard College, and the banquet at the new Union League Club House, Friday evening, September 14th, are all very pleasantly remembered.

One of the disappointments of the meeting was the absence of the President, Hon. Marshall P. Wilder, and the expected pleasure denied some of the delegates and members of making his acquaintance there. This was the greater disappointment to me from my knowledge of the fact that had it not been for his efforts to have us represented there, our fruits would probably never have been collected, and possibly no delegate have gone; and I was anxious to have him see our fruits and enjoy them. Early in the winter I sent him a box of our Wealthy apples for inspection, with the compliments of the Minnesota State Horticultural Society, and received the following letter of acknowledgment:

LETTER FROM PRESIDENT WILDER.

DORCHESTER, MASS., Dec. 4th, 1883.

My Dear Sir:

Thanks ! thanks ! for the box of apples which have come to hand and mouth in most perfect condition. I am surprised with their beauty and excellence, and shall exhibit a dish of them next Saturday before the Massachusetts Horticultural Society. Minnesota was much honored by the exhibition of her fruits at the session of the American Pomological Society, in Philadelphia, which I very much regret that I could not have seen. If Minnesota, though far to the north, can produce such fruits, she will at least, in apples, be able to compete favorably with the most favored states of the Union, and her government could not do a better thing than to foster and encourage the cultivation of fruit wherever it may succeed within its jurisdiction, and I hope that Minnesota will come up with fruits, and what is better still, with her noble men, in full force, at the meeting of the American Pomologial Society in Michigan, in 1885, and may I be there to give them a hearty welcome.

The Wilder Medal, which your State so richly merited for its exhibition at the late meeting of our society, will soon be engraved and forwarded to you.

MARSHALL P. WILDER,
Pres't American Pomological Society.

OLIVER GIBBS, JR., ESQ.,
Secretary, &c., &c.

In conclusion I will say that in paying the membership contribution at the meeting, I did so with the understanding that it placed our society officially on the roll, and the society will hold the membership and receive the transactions when published.

One word about the next meeting of the American Pomological Society.

President Wilder has told you in the above letter where it is to be held.

I hope our society will resolve at this time to be represented there, and make timely preparation for it, and if nature favors us with a good crop of fruit in 1885, we may, even if we should not win another medal, at least show that we still have something to justify our holding the one we have got.

And now, Mr. President, and fellow members of the Minnesota State Horticultural Society, here is your certificate of the award, which I will read :

CERTIFICATE OF AWARD.

AMERICAN POMOLOGICAL SOCIETY,
SECRETARY'S OFFICE, AGRICULTURAL COLLEGE,
Lansing, Mich., Sep. 15. 1883.

Mr. Oliver Gibbs, Jr., Secretary Minnesota Horticultural Society.

DEAR SIR :—This will inform you that at the recent meeting of the American Pomological Society, the committee on the awarding of prizes, unanimously gave a silver medal to the Minnesota State Horticultural Society, for its collection of apples and grapes. This is the highest award given by the society. Your show of fruit was a surprise to most of the members from the south and east, and was excellent. Only four Wilder medals in all were awarded at this meeting.

Truly yours,
W. J. BEAL,
Secretary.

And here is your medal. It was fairly won. It was given us with many compliments from the committee and members and with hearty good will. It was not begrudged to us by anybody. If it shall encourage our own people to look up and appreciate the advantages we possess in fruit growing as well as the exhibit convinced the public at Philadelphia, and if it shall stimulate us to press on and overcome difficulties and obtain other advantages, till we make apples, and pears, and cherries, and plums, and other fruits, staple crops for money and comfort in the Northwest, I shall be satisfied with my share in obtaining it.

OLIVER GIBBS, Jr.,
Secretary and Delegate.

Lake City, Minn., Jan. 5th, 1884.

POSTSCRIPT TO THE FOREGOING REPORT.

Appended here is an extract from the Delaware County Record, published at Media, Pennsylvania, which is a fair sample of both public and private comments on our exhibit from eastern standpoints:

> "The Minnesota State Horticultural Society was notably represented by an exhibit of 140 varieties of apples; 30 varieties of hardy grapes and a collection of wild plums. The entire collection of apples showed a perfection of form and smoothness of skin most remarkable, especially when it is remembered how difficult a task it is in Pennsylvania to grow really well-formed, ripe apples. Each variety and indeed each specimen gave demonstrable proof of the adaptability of Minnesota soil and climate to the growth and development of all kinds of hardy fruit. One variety, named the "Wealthy" was especially fine, being a prolific bearer, perfectly hardy and an admirable keeper. Even the dwarfish crab apples grow to a large size and develop a rich flavor and saccharine, juicy taste. The "Duchess of Oldenburg," popular everywhere, was exhibited to great perfection, and in form and color was all that could be desired. The exhibit was the finest of its class made, and reflected great credit on the Horticultural Society of Minnesota, no less than on the climatic conditions of a State which could produce such choice fruit.
>
> "In this collection A. W. Latham, Excelsior, Minn., exhibited 20 varieties of hardy grapes; an excellent exhibit."

The medal was then presented to the President and through him to the Society. It is of silver, enclosed in a velvet and leather case; its diameter is about two and a half inches. Upon one side is a medallion portrait of President Wilder, with the inscription around the portrait: "American Pomological society. Founded 1848. Marshall Pinckney Wilder, President." On the other is the inscription, "Minnesota Horticultural Society, for collection of apples and grapes, 1883." Surrounding this is a rich wreath of fruits and flowers, the whole forming a beautiful as well as a durable medal.

C. L. Smith then offered the following resolution:

Resolved, That the Minnesota State Horticultural Society hereby tenders a vote of thanks to Secretary Oliver Gibbs, Jr., for his care, skill and excellent judgment in collecting, handling and exhibiting the fruits of this State, at the meeting of the American Pomological Society, and for his faithful representation of this Society and the State at said meeting.

After remarks by several members, the resolution was unanimously adopted.

Col. Stevens. I move also that the thanks of the State Horticultural Society be tendered to the several gentlemen who contributed fruit for exhibition at the recent meeting of the American Pomological Society, by which contributions the Society was awarded the highest premium for fruits by the said American Pomological Society.

This motion was also unanimously adopted.

Secretary Gibbs. Now, Mr. President and fellow members, I have a resolution to offer in relation to this medal. It was firstly the gift of President Wilder to the American Pomological Society. He authorized its committee to award sixteen silver medals to be furnished and engraved at his expense. The committee thought best to divide the exhibits of all fruits into four groups, and award only one medal on each. To us came the award on apples primarily, but including our grapes, as ours was the second best, display in this department. How much you and the State are indebted to this noble pomologist for the medal is not expressed in the facts here given—hardly a hint of it. It was to his encouragement given to your Secretary, perhaps to others of our membership by many letters—his letters to the Governor of our State, and I know not to whom else—his determination that Minnesota should be represented at Philadelphia, none the less all other States—his large-heartedness and broad views that unselfishly took in the whole continent, all that was American, under whatever flag; that would have been cosmopolitan and embraced the fruits of the people of all nations, had the society given this scope—his zeal that would not tire, however those he sought to help might be inclined to falter in their own cause;—it was this that put Minnesota into the meeting with her fruits. I cannot tell you all the steps and details of his influence. I only know that without it we should never have had a bushel of fruit at that exhibition; and Minnesota would have been regarded to-day as she was in public estimation six months ago, as a country where you can raise wheat. but not apples, and this medal would have been at this time the subject of a pow-wow in a state a good many degrees further south and west—a state which may dispute our claim to a similar award in 1885, but by fair and generous rivalry. I move, therefore, that the thanks of this society be conveyed to

President Wilder for this medal, and for his fatherly care for the pomological interests of the State of Minnesota, which he has done so much to promote in many years gone by, and that we express to him our hope and wish that life and health may be spared to him to meet with us at the next session of the American Pomological Society in 1885, that we may greet him there and show him by our presence and our exhibits of fruit that we are profiting by his teaching and his example.

The motion being seconded, was carried by an unanimous and hearty vote.

The following resolution was presented by the Secretary:

WHEREAS, This society is doing business with funds donated in part by the State, and whereas, it is desirable that the state officers and members of the Legislature should have a more convenient opportunity to mingle with us at our meetings, and to examine the horticultural productions that we exhibit, particularly our Minnesota fruits; therefore,

Resolved, While keeping our home at the Agricultural College in Minneapolis, and continuing to hold our summer meetings here, that hereafter our winter meetings, occurring in the years of the sessions of the Legislature, be held at St. Paul in the room tendered us for that purpose by the Governor.

The resolution was unanimously adopted.

The subject of the World's Industrial and Cotton Centennial Exhibition, at New Orleans, being presented for consideration, Truman M. Smith moved that members be requested to raise and select the finest fruits possible for the Horticultural Department of this exhibition, and be ready to contribute them if the State should decide to be represented there. The motion was adopted.

M. C. Mesmer then read the following:

REPORT OF RUSSIAN APPLES AND OTHER FRUITS TESTED IN CARVER COUNTY.

BY ANDREW PETERSON, WACONIA, MINN.

To the Minnesota State Horticultural Society :

I promised your secretary that I would give my experience in fruit raising, but on reading your report of 1883, I have found the records of so many fruit growers who have done more than I have, that I need say but little.

It was in the year 1857 that I began to plant fruit trees in Carver county, and I have planted more or less, nearly every year since that time, but without much success until I began with the Russian varieties, which seem hardy enough for the Minnesota climate. Of the seventy other varieties I have tried, all blighted or sun-scalded more or less when they commenced to bear. Of the apples, the Duchess stood best against blighting; and of the crabs, the Maiden Blush. When the blighting commenced I had the trees heavily mulched. I did not like the mulching, because it drew the roots up towards the surface of the ground, and even into the mulching. I remember an old farmer in Sweden used to say: "Plant a stone with the apple tree and then you will have a healthy tree." I have also observed several times in the nursery rows, a stone close to the tree. Those trees looked healthier and did not blight. As we know that the stone keeps the ground cool, I wonder if the low temperature prevents the sap from rising too early. I should like to know if anybody has tried this or had any experience in it. I will try it myself next spring.

THE RUSSIAN APPLE TREES.

In the year 1875 I got cions of thirty sorts of the Russian apple trees from Hon. William Saunders of the Department of Agriculture at Washington, being a part of the importation made under his supervision in 1870; put them upon apple roots, and set them out in the spring of 1876, so that they, or such as survived, are now eight years from the graft. Some of them were of the German name, and all these failed.

WINTER VARIETIES.

No. 378, Hibernal, neither blighted nor sun-scalded; bore last year lots of large fruit.

No. 472, Ostrekoff's Glas, just as hardy as the Hibernal; good bearer, but fruit a little smaller.

No. 410, Little Seedling, bore fruit this year; small apples, but heavy bearer.

No. 70, Winter Pear, and No. 580, Winter Lowland, have not fruited yet; blighted some last year, but this year not.

LATE FALL OR EARLY WINTER SORTS.

No. 240, Lieby, the tree is hardy; fruit large, and of fair quality; bore a good deal last year. This and the Ostrekoff Glas seem to be of the Duchess type, but the trees are hardier.

No. 170, the Revel; No. 310, Christmas; No. 335, Green Transparent; and No. 874, Sweet Mushroom, have not fruited yet, but seem to be hardy trees.

SUMMER APPLE.

No. 262, Charlamoff, is a larger and better eating apple than the Duchess, and the tree looks hardier. It bore lots of fruit last year.

My apple trees bore very little fruit this year, as the blossoms were spoiled last spring by frost.

If this is to be read in the meeting, I hope I will be excused, as I am not posted in the English language, so that I may not have given it its proper form.

The programs and premium lists received, and I will distribute them.

If I am well I will come to the meeting, January 15th, and bring the Russian apples with me.

A few days ago I was out in the western part of Carver county, and found there a number of Russian varieties on the farm of P. H. Terlinden, in the town of Young America, recently bought of Mr. Thomas, who planted the trees. The labels were all off except one or two trees, but Mr. Thomas gave me his original plat of the plantings. When I came home I made labels according to the plat, and went out again and labelled all the trees that I thought were of any value, and cut a few cions from the following:

No. 264, Smelling Apple.
No. 986, Green Annisette.
No. 287, Riga Transparent Juicy.
No. 558, Early Cinnamon.
No. 268, Saccharine.
No. 413, Cross Apple.
No. 128, Sheepnose.
No. 475, Holdfast.
No. 177, Green Streaked.
No. 178, Barloft's Apple.
No. 275, Zolotoreff.
No. 398. Enormous.

It was not the proper time to cut cions in the winter, but I thawed them out in moist ground, and think they will be saved.

Julius Ackerman, in that part of the county, I was informed, had a vineyard of very nice grapes.

Waconia, January 7th, 1884.

Mr. Pierce. I have seen the Russian apple trees on Mr. Peterson's place. They have been put to a very severe test, and the varieties named in his report as hardy are truly in perfect condition. They have had all the sun, wind, heat and cold possible—no protection whatever—and yet after eight years' growth are uninjured in any respect. Some of Mr. Peterson's Russian sorts have failed, as he says; but where they failed the Wealthies failed—not hardy enough. Mr. Peterson has got something in these staunch survivors that are hardier than Wealthy, hardier than Duchess even, and the quality is good. He has done a great work out there all by himself for the horticultural society, in his experiments and successes, and has been liberal with us in supplying cions for our experimental stations. Therefore, Mr. President, as a mark of our appreciation of this farmer's services to the public in fruit raising, I move that we make him an honorary life member.

Secretary Gibbs. I found Mr. Peterson and his Russian apple trees in my searches for fruit for the American Pomological Society. They were a great surprise to me. I recognized them at sight as an acquisition. It was in August. The fruit was not ripe, but it was even then very large and handsome. They were the first root grafted Russians I had seen—and the first winter keeping Russians I had heard of in the state. Hardly daring to trust my own judgment, I went there again in November, and asked Mr. F. G. Gould, a member of our executive committee, to go with me. We found the apples then matured, and by an exchange with Mr.

Peterson, obtained a supply of cions for our society, which have been distributed for propagation for our benefit. A list of the cions will be printed in the anual report. Pending the resolution I would like to hear from Mr. Gould.

Mr. Gould. Some of these trees are the hardiest I have seen in Minnesota. I have visited them again since I went there with Mr Gibbs in order to see if my first impressions would be confirmed. They are not all absolutely perfect, as Mr. Peterson states himself, but there are sorts among them that are, and I believe we have got something here that cares nothing for our cold winters or our hot summers. From the form of the apples I should judge them to be of the Aport class.*

The question being called on the motion to make Mr. Peterson an honorary life member,

Mr. Peterson arose and said:

Mr. President, I am old. It is not much more that I can do for horticulture.

Mr. President, I guess you better draw that back.

But the motion was put and adopted unanimously.

Mr. Peterson thanked the society for the honors paid him, but did not think he had done anything to deserve them. Many of his neighbors, like himself from the old country, would be benefited by the society's publications, and he would like to get them for distribution, and have his people unite with the society in its future work.

On motion, so much of the Secretary's annual report as related to accounts of moneys was referred to the Finance Committee, and the recommendations of the Secretary on other matters were referred to a special committee, consisting of R. J. Mendenhall, Truman M. Smith and Prof. Edward D. Porter.

A recess was then taken till 7 p. m.

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*Note by the Secretary. From descriptions I gave Prof. Budd of tree and fruit, he recognizes them as a form of the Anis, a race having many variations, but all hardy in tree.

EVENING SESSION.

Second Day, January 16th.

The evening session was held in the room of the Delta Sigma Society, at the University of Minnesota.

The first paper read was the following:

OUTDOOR RECREATION AND EMPLOYMENT FOR WOMEN.

BY MRS. IDA E. TILSON, OF WEST SALEM, WIS.

The American people are fast livers. As children they are in a hurry. The popular school teacher is she who promotes most rapidly. Pupils cram with feverish eagerness for examinations, and talk less of a well-rounded education than of passing into higher classes. They enter society young, and grow prematurely old. The climate is peculiarly stimulating. Thousands of fertile acres west are given away for the asking. Excited emigrants thither load trains and fill hotels. Every day there comes the shock and pain of parting with friends. Omnipresent telegraphs and newspapers, every day stir up people about all the murders and accidents in two hemispheres. Advertising devices weary by their number and pertinacity. A late Sunday-School *Times* truly said, "Our fathers dwelt by a quiet pool, we have ever the roar of an ocean in our ears." Even fashion has its fierce competitions. It is a saying "as well be out of the world as out of fashion," certainly as well be out of the United States. Parisians, though they invent the fashions and coax away the dollars, themselves use far plainer furniture, food, and clothing. American families of but moderate means, go through one round of twisting, turning, planning and economizing to keep up appearances. Is it strange that insane asylums are numerous, spacious and well filled, or that new varieties of nervous diseases are constantly being discovered ? A recent English visitor, Herbert Spencer, the philosopher, gave his word of warning. Women, with their sensitive and delicate organizations, are perhaps greater sufferers than men, and especially need relief and recreation.

The usual agency employed to relieve overstrained nerves, is a multiplication of artificial amusements which but continues the fatal excitement. Where accessible, theatres and operas are crowded. Can glare of lights and gay costumes, constrained sitting, late hours and appeals to emotion, prepare one for repose ? Does reading high-pressure novels, or whirling in the dance, or jolting in the cars, give tranquility ? There may be intellectual or artistic merit in these entertainments, but not rest.

If recreation is to renew or refresh, it must supply what everyday occupations do not, natural, unstudied pleasures. The average woman is confined within doors much more than the average man, and her work is more monotonous. Her recreation, therefore, ought to be out of the house and away from dull routine. A physician, coming into Wisconsin at an early day was told there would be no business for him. "I will wait," he replied, "till folks finish off their houses, furnish and shut them up, then I'll have business." In well-ventilated rooms there is liable to be some carbonic acid from breaths, or drain and cellar germ-life, or dust of disintegrating walls and furniture, or too much shade. Pure, out door air has never had a reputation for making people sick. Sunshine itself is a highly recommended medicine. Communion with nature constantly brings one into contact with fresh influences. The earth is forever sweeping on to new positions in space. There are never two days, nor two sunsets, nor two trees precisely alike. Floods, drouth, blight, or grubs, upset all calculations, make every season, for some reason or other, very remarkable, and continually test "the memory of the oldest inhabitant."

Lawn mowers, garden rakes, and hoes, are not beyond the strength of a creature that can roll pie-crust and wash clothes. Gathering and planting seeds is light work. Women have just the promptness to insure success in early gardening. It does not require genius to graft and bud trees. Several women have practiced this art successfully, one of whom has lately written, on this subject, an interesting article for the Youth's Companion.

Horticulture furnishes forms of enjoyment not properly utilized by ladies. A well-arranged yard is as convenient as an orderly house. People who raise their own vegetables and fruits, can have them when they are firm but not unripe, and juicy but not decayed. They will eat their greens earlier and oftener than one dares who purchases at market prices. A fine flower-bed permits its owner to enjoy the luxury of giving. Its lovely blossoms will not only decorate home tables and mantels, but also ornament the house of God, cheer the sick-room, and soften death's hard outlines. Not all can afford costly gifts, nor does every one care to be under obligations for such. Flowers and fruits make delicate and inexpensive presents, which any one may give or freely accept. A walk or ride is soon over, pies and cakes disappear with alarming rapidity, dishes have to be rewashed three times a day; but flower-beds are bright for weeks, and tasteful grounds grow in beauty with years.

Those excellent outdoor exercises, riding, walking, and croquet, already accepted and appreciated, whose claims, therefore, it is not so necessary to urge, they are very delightful when horticulture has preceded them. Pleasant streets and roads are always resorts. Visitors and friends are taken to see them. And, in proportion as such places grow more handsome, are they more frequented. Croquet and kindred games are hardly practicable without a smooth lawn. Convenient seats often allure one into a game. The possessor of a garden-plot frequently inspects its flowers and fruits, and whoever has a vine and a fig tree of her own, naturally rests in their shade. Thus horticulture not only brings its rewards, but brings people out to see what those rewards are.

If possible, every person ought daily to learn something new and valuable, though not necessarily from books. "It is not all of life to live." Unfortunately, many a woman's education is finished in her teens, just when she is beginning properly to study and think. Horticulture summons many sciences to its aid, and combines with recreation fine intellectual opportunities. The habits of plants are learned, the nature of soils, the effects of moisture and heat, and the depredations of insects. Without knowing it, one becomes a botanist, a geologist, a meteorologist, and an entomologist. Chemistry teaches how to compound and where to apply fertilizers and explains why some of them are potent at once, and others only in time. Isaac Newton watched a falling apple, and discovered that great law of gravitation which governs myriads of worlds. The wonderful machines for farm and garden use, inventions mainly of practical workmen, are often but extended applications of principles in natural philosophy. To discover laws of nature and habits of plants and insects, there must be close and long-continued observation. By time the facts are gathered there will have been much excellent mental exercise and discipline besides. So great is the variety of grasses, plants, trees, flowers, and fruits, that there is as much scope for judgment and taste in arranging yards and gardens, as in designing and painting pictures. Landscape gardening indeed rises to the dignity of a fine art. To be sure, one may ignorantly plant and successfully gather, yet such is not likely to be the case.

Women are expected to be the teachers of refinement. They ought, therefore, to fit themselves for this work in God's great Normal school of beauty. A story is told about a plant, which was given to a poor family, who could not see it through their dirty window, and in consequence, washed the glass. Then the room, by contrast, seemed very grimy, and was cleaned throughout. The flower looked so well, they added other adornments to their home. Neighbors caught their enthusiasm, and, ultimately, the aspect of a whole block was changed by the ministry of a flower. "Picciola" may be familiar, that French classic, with the further merit of being true, which relates how Count de Charney, gay, accomplished, and skeptical, being cast into prison, was cured of his moral and physical disorders by a little plant, which thus achieved what neither books nor men had been able to do. The prisoner wrote on his cell wall "Chance is the sole author of the creation." A flying dove dropped a solitary seed into his prison yard. The seed was trodden under foot, but a fleshy envelope, affording protection to its first, tender leaves, helped the plumule through the hard crust above it. A frosty night came. The thick bristles upon its stalk were covered with rime, but the plant itself was uninjured. Hail fell, and its leaves closed about the stem, presenting a series of points only. Though nourished by the same soil, peduncle, leaves, and blossom, each, in some way, appropriated its own hue. When high winds blew, the flower prudently bowed. Charney added "perhaps" to what he had written before on chance. Ill, a decoction of the leaves cured him. Erasing all that was on his cell wall, he then wrote "I belive in Providence." In one severe storm, he stationed himself near his favorite, and, bending over, devoted himself, like a lover, to its protection. The coarse, rough jailor became interested. He even watered the plant, and sanctioned removing one of the flag-stones which hindred its growth. Visitors heard the story. The Empress Josephine was petitioned for Charney's release. Now Josephine was an enthusiastic admirer of flowers. It is said she loved the crimson of her lilies better than the hue of her royal robes, and the fragrance of her magnolias, far more than the breath of courtly flattery. She, therefore, became Charney's willing advocate, and he was soon liberated, it is needless to say, a changed man. A faded blossom, in a valuable locket, long told the story to his descendants. Insect life, equally with plant life, shows adaptation and design. Can any one say that natural outdoor beauty is without moral influence?

The education of children is too often conducted by prosy and dull methods. The deservedly popular object lessons are hardly frequent enough. How can a mother so effectually tell her little ones to be joyous, like the birds, industrious as the bees, and modest like the violets, as when these living objects are present? A very young child may be taught to pity thirsty plants, and to carry them cold water. What better place than a garden for telling about Gethsemane's scenes, or about that heavenly home, "the leaves of whose trees are for the healing of the nations!" An acquaintance, a refined woman, who went west at an early day, and amid great privations, said, in answer to wondering inquiries. "In summer my children had always one place fit to receive their visitors—the garden." Will not such a painstaking mother keep her loved ones at home and away from temptation?

In practical America, the economic aspects of a question always command attention. There is never a lack of women and girls ready, for money, to enjoy sunshine, and to improve health, by tying and picking hops, or picking sage and berries. An acquaintance, a farmer's wife, left a widow with a large family, carried on her farm, kept her children together, and reared them all to fill respectable stations. The Youth's Companion lately told of two sisters with feeble, aged parents and no resource other than a small, poor farm. They seeded considerable of the land for pasture, bought cows and fowls, set out an orchard, learned to do many new things, hired their hardest work done, and gained, beside the respect of all who knew them, a fair competence. Have there not been many similar cases.

Not every one has a taste for farming, nor the strength. Perhaps no inexperienced person ought to try such work. But, if a woman is already living on a farm, and necessity arises, instead of selling at panic prices, she better, at least, try the experiment of remaining there and managing the business. Poultry is especially profitable near barns and on farms, where there is always more or less grain wasted in feeding stock and in threshing. A large grassy run furnishes the cheapest and healthiest food, lasts a whole season through, and requires no daily preparation. One woman, who is a poultry-fancier, advertises in that prominent agricultural paper, the Western Rural. Bees are not liable to be taken up for trespass. The apiarist need not own land, but must have her location reasonably near meadow and woodland sweets. A few years since, one of the best and largest apiaries in the country was owned and managed by an Iowa woman. There are many live journals devoted to bees and poultry. Whoever is inexperienced, ought to take and read one of them. Intelligence and skill command as high a premium outdoors as indoors. Silk culture is now attracting much attention among Southern women. This is mainly conducted within the house, but, if the person engaged in it, plants and cultivates her own mulberry trees, and gathers the leaves herself, a pleasant combination of indoor and open-air work can be made. Italian women do so. A friend in California has gathered grapes and successfully cured them as raisins. More than one orange plantation of Florida owes its thriftiness to woman's care. The cultivation of orange trees, about which plows are little used, and hoes, rakes and brushes are chief implements, is just the work for her patience. A few years ago one woman in that state was employed by northern parties to superintend five different groves. The United States is the greatest strawberry-eating nation of the world. Who ever heard of strawberries being unsalable or thrown away? A small plot, well tended, yields large returns; so their production is practicable in villages and towns. Women and girls already do the picking. Is the planting and weeding any harder? With an occasional lift from masculine arms, and some weeding by little hands, vegetables can be grown. Mrs. Hoyt once said she had known a quarter of an acre, after the women of the household had taken it in hand, to yield vegetables enough for a large family, in no small variety either, besides a fair amount of small fruits. If it had before been customary to purchase these supplies, think of the saving. If, however, the fare had included no such dishes, the crisp lettuce, juicy radishes, delicate asparagus, and tart berries of that new administration must have lessened meat and flour bills. People do somehow satisfy hunger, if not with vegetables, then probably with pastry. In large cities there is some market for fresh flowers and tasty bouquets, other than greenhouse products. At Christmas, Easter and various holidays, there is great demand for evergreens, mosses, berries, lichens, and all woodland treasures which make beautiful and lasting decorations. It has often paid persons living at quite a distance, to gather these and to send them into cities. A few women in the tropical south, far west, abroad, or in any favorable locality for seeing new and rare things, get employment as collectors of specimens for botanical and other societies. Ladies who thoroughly qualify themselves by an actual and extended field practice in analyzing, are quite certain to have opportunities for teaching botany, a work generally reserved for them and always considered peculiarly appropriate. None of the pursuits above suggested will be apt to give an entire support, except general farming or poultry raising, but any of them will nicely supplement small incomes, and, at the same time be pleasing and healthful. Many of them are not inconsistent with other employments.

Some outdoor work does not yield immediate pecuniary returns, but is ultimately of importance. People, by living solely for the present, can be "penny wise and pound foolish." That they may have a few more acres in wheat, farmers often cut down choice timber, regardless of its worth as a wind-brake and as a retainer of moisture, moderating the air for rods around, and also of its great future value in wood and lumber, prices of which are constantly advancing. Wasteful methods of conducting the lumbering business are decreasing American forests with frightful rapidity. Ladies can interest themselves in the preservation and care of natural woodlands. They can join in forestry associations. By planting land to valuable timber, like locust and black walnut, a hundred per cent. has been realized in after years. The consumption of the walnut is more rapid than its natural increase. For many uses, neither other woods nor iron can equal it. Western tree-claims are becoming quite fashionable possessions for women, many of whom are themselves assisting in or superintending the planting and cultivation. The money expended for producing natural beauties on a place is always got back in selling, generally with high interest, but very rarely that invested in buildings, never so good as when new. Follow Nature, who hangs ivy 'round ruins and covers fallen trees with moss. The fashion of handsome grounds will prove as taking as any other. Whoever surrounds herself with beauty will lead her neighbors to do likewise, and, in a short time, there will be not only one fine place but a fine street, a fine section of country, perhaps finally a "banner" county. The wealthy and refined will be inclined to remove thither. Their means and society will promote the business and welfare of all. Many a commonplace village has been dressed in loveliness by a rural improvement association. A writer for the Independent has instanced Mishawaka, Indiana, near South Bend, and Winnetka, a suburb of Chicago, where ladies have been enlisted in this work as theirs by nature and by right.

Outdoor employment as a means to these various ends, health, pleasure, culture, and gain, is comparatively inexpensive. Doctors' fees and medicines make larger requisitions of purse and courage than do rakes and water-pots. The possessor of shade trees and a tasty yard, has, for years perhaps, the pleasing use of the same things. It is not so with fine equipage and clothes, very soon worn out or unfashionable. Theatres, operas, and journeys are costly recreations, Garden work hardly admits of elaborate toilets, much less demands them. Nature's pages, ever open, can well be supplemented with books, but are in themselves a vast, universal library. No book-cases have to be provided, nor worn bindings repaired. A dollar's worth of seeds will sow a whole vegetable garden. The capital required for beginning a poultry or bee business, is ridiculously small. Twenty-five dollars spent for trees and shrubs, may, in a few years, add hundreds of dollars to the value of property.

Nor is there any neglect of housework proposed. "These ought ye to have done, and not to leave the other undone." It is believed proper outdoor recreation will give such increased health and vigor, that the same amount of indoor work can then be done in less time. The experiment is worth trying. Change does much to quicken preceptions and faculties. A man may find it profitable in more ways than one, to provide extra help in the kitchen.

If fashion and fame have weight with women, they ought to be reminded that Queen Victoria often attends the meetings of the Royal Horticultural Society. Mrs. Stowe's snccessful and famous orange grove has done much to interest people in Florida. She took a very active part in arranging and furnishing exhibits for the Horticultural Fair, at Jacksonville, in 1877. Bayard Taylor's mother last year won the first prize offered by the Woman's Association for the promotion of silk culture. Miss Youmans is author of a standard botanical treatise. Mrs. Treat writes for the first magazine of the land, on those special and rare phases of plant and insect life with which she is so familiar. Miss Murtfeldt is one assist ant of the national commissioner of agriculture, in his entomologic al department. Mrs. Comstock prepared several drawings for his last report. This list might be continued almost indefinitely.

Nature may be called the great mother. By her grains and fruits, all live. In her genial presence, any one may gain new hope and strength. On her bosom each will finally sleep.

"But O, thou gentle Summer!
  If I greet thy flowers once more,
Bring me again the bouyancy
  Wherewith my soul should soar!
Give me to hail thy sunshine
  With song and spirit free;
Or, in a purer air than this,
  May that next meeting be."

A vote of thanks and an honorary life membership was tendered to Mrs. Tilson, and she was cordially welcomed to membership by the president, who followed in some remarks about the work of women in horticulture, particularly in the raising of small fruits.

The next paper read was

THE GARDEN IN LITERATURE.

BY OLIVER GIBBS, JR., OF LAKE CITY, MINN.

Garden—An enclosed place for the cultivation of trees, plants and flowers.

It speaks well for the rank of Horticulture as one of the employments of man that in the records of all civilized and semi-civilized races, his greatest happiness in this world, and, in some of their theologies, in the next, is depicted in connection, one way or another, with the garden.

In the story of the creation the writer, wishing to represent the first pair in the most favorable situation for happiness, places them in a garden. This shows that in that far-off, misty part, when this story was written, the garden was then as now one of the brightest realities of life, as well as the poet's dream. And when misfortune marks them for its own, in what shape does it come? Consider it for a moment as it if were really a poem, a work of a romancer's imagination, seeking to show the contrasts of joy and sorrow in human life, while accounting for the origin of a race of perfect beings and the introduction of sin and misery in the lives of men. What shall their punishment be? A limit to their lives? Dissolution of the body some nine or ten hundred years afterward? Physical toil,—the mere cultivation of the soil and the tending of flocks,—a pleasure to well-organized men? For Mother Eve, the duties of the home and the care of her family? This does not satisfy the poet's conception of trouble. Some crushing woe must be made to fall, and they are banished from their garden.

> "Banished ! Oh, Friar, the damned in hell do use that word,
> Howlings attend it."

A redeeming thought in relation to this woeful banishment is that we are not told that they had either made the garden by their own toil or bought it with a price, or had a warranty deed or any bond for a deed, or were foreclosed out of it on a mortgage. But though they were tenants at will, we can agree with the writer that no greater punishment could have been devised and made probable to suit the circumstances of the case than to drive them out of the garden, without any equipments to make another. We are not even told that they were allowed to carry away their garden implements or seeds for a new crop, or cions from any of the trees, unless possibly Mother Eve had some from the apple tree concealed about her person.

Much of the poetry of the Hebrew nation is concentrated in the Song of Solomon. I shall take the liberty of erasing the head lines of the scribes and consider it for what it appears to be,—a song of love. And now look through it and see how at every turn of the poet's thought, some picture of the garden flashes into view:

> "As the apple tree among the trees of the wood, so is my beloved among the sons."
>
> "I sat down under his shadow with great delight, and his fruit was sweet to my taste."
>
> "Stay me with flagons, comfort me with apples ; for I am *sick* of love."
>
> "Lo, the winter is past, the rain is over and gone, the flowers appear on the earth, the time of the singing of birds is come, and the voice of the turtle is heard in the land."

I will take the further liberty of adding a line to this song, and say of this turtle, which is supposed to be our gentle friend, the turtle dove—

> "Behold, where she alighteth in the strawberry patch, there is the first ripe berry;"

And still another line,

> "Also, she is welcome to it."
>
> "The fig-tree putteth forth her green leaves, and the vines with the tender grape give a good smell."

Are the lovers in the song separated, they seek each other in the garden.

> "I went into the garden of nuts to see the fruits of the valley, and to see whether the vines flourished and the pomegranates budded."

Do they meet elsewhere, they repair to the garden.

> "Let us get up early to the vineyard; let us see if the vine flourish, and the pomegranates bud forth."
>
> The mandrake gives a smell, and at our gates are all manner of pleasant fruits."

Twice they say in this song they are sick of love; but they never seem to tire of their garden.

Take any history of oriental nations, where do you find the people in their happy moods? Persian or Turk, Hindoo or Chinee, it is in their gardens.

At the mention of the city of Babylon, what picture is conjured up most brightly in our minds as we dwell on our readings of her ancient splendor? We behold in the distance the artificial mountain on the plain of the Euphrates, its high rocky precipices overhung with verdant vines and their summits crowned with lofty trees; and as we come nearer we see that here are the Hanging Gardens of Nebuchadnezzar, whose columned terraces were called by cotemporaneous nations, one of the wonders of the world. The Indian princes built some of the most magnificent temples on earth, which are still the wonders of architecture, to the memory of their dead wives—an example of taste we are not qualified to fully applaud or quite condemn; but our ancient brother who built these hanging gardens, and who was no doubt President of the Horticultural Society of Babylon, set us a better example, as they were a memorial, not to the dead, but of his devotion to a wife while living and within the reach of his care and sympathy.

History has left us but little that we can know of Babylon, but the Hanging Gardens must have been the scene of many a happy festival—perhaps a Mecca for horticulturists of all nations to visit—certainly the resort and pride of the Chaldeans; and when we read that Nebuchadnezzar ate grass and companioned with oxen we almost fancy he is under the slander of some envious heathen who has heard of, but cannot understand the sweet herbs of this garden, or the *celery* that even then might have been brought up from the sea-coast and domesticated for man's use.

Coming this way a few centuries, look at Mark Antony and the Roman citizens at the burial of Julius Cæsar. Brutus has addressed the multitude, and convinced them that Cæsar was ambitious, and the preservation of Roman liberty required that he should be slain. His assassination was, therefore, an act of patriotism, and Brutus was now their hero for having done it. Antony ascends into the rostrum. They frown upon Antony. They will listen patronizingly to a temperate eulogy of Cæsar; custom and decency demand this; but

"'Twere best he speak no harm of Brutus here!"

Antony commences his oration. He tells them of Cæsar's services to the Roman state; his benevolence to the poor; his refusal of the crown when offered, thrice, at the Lupercal; their own former love for Cæsar; and now behold the spring in their hearts that he touches at last to fire them to rage and mutiny against Brutus and his fellow conspirators. He tells them of the provisions of Cæsar's will.

"Moreover he hath left you all his walks,
His private arbors, and *new-planted orchards*
On this side Tiber; he hath left them you,
And to your heirs forever; common pleasures,
To walk abroad and recreate yourselves."

What! the imperial parks, arbors and orchards left to the common people of Rome—the toiling masses—for their enjoyment, they and their heirs forever. Is it any wonder that all blame for Cæsar's ambition, all complaisance towards Brutus defending the assassination, vanishes from their thoughts, and that when Antony after a pause in his oration, exclaims:

"Here was a Cæsar! When comes such another?"

They answer in their new sense of bereavement,' 'Never! never!" and kindling into fury at the thought of the conspirators who have striken down this great friend, they shout:

"Away! away!
We'll burn his body in the market place
And with the brands *fire the traitors houses*!"

I am afraid there were no horticultural societies in those days in Rome, else parks and orchards for the common people could not have been so precious and so rare. In fact it is almost certain there were not, for Pliny tells us they had only twenty-two varieties of the apple in his day, and it was then among their people such a sour and astringent fruit that the Romans bestowed on it "many a shrewed and bitter curse;" and hence we have its generic and inappropriate name to-day, *Pyrus Malus*, the fruit that is *bad*. If we ever have a World's Pomological Convention, the committee on nomenclature should change this, and gild the apple with a new name in Latin, culled from the choicest terms they have.

I have often studied the tragedy of Richard the Third and its antecedent the Third part of King Henry the Sixth in Shakspeare, to come if possible into the mind of the great dramatist, and find out the secret of Gloster's power over his associates of the court, over whose downfall he was ever scheming to make his bloody and usurping way to the English throne, and yet holding them in action subject to his will, until, one after another, it came their turn to die. Consider him in the scene at the Tower, where the council has been called to take action about the coronation, but which is to culminate in the sudden denunciation, arrest and execution of the unsuspecting and light-hearted Hastings, whom now, at the opening of the council, and before, "My Lord Protector" has, in his own mind, already turned "down the road to dusty death," along with the young prince whom they all but Gloster and his two confederates are soon expecting to bow before as the new-crowned successor of the new-buried king.

Enter Gloster to his ghastly business. He arrives late. All has been done except to name the day, and this were done had he tarried a moment longer, for Hastings has spoken for him—Hastings is sure of Gloster's love, and he may take that liberty. Gloster's secret thought is to break up the council at all hazards and throw the blame on Hastings, who shrinks from following him further in his career of treachery and ambition. How does he disarm suspicion and screen his own sinister thoughts from penetration of his victims? Was ever such diabolical dissimulation really seen on earth? It seems almost incredible:

"My noble lords and cousins, all, good morrow ;
I have been a long sleeper; but, I trust,
My absence doth neglect no great design,
Which by my presence, might have been concluded."

Buckingham replies:

"Had you not come upon your cue, my lord,
William Lord Hastings had pronounced your part—
I mean your voice for crowning of the King."

And Gloster still acquiescent:

"Than my lord Hastings no man might be bolder.
His lordship knows me well, and loves me well."

Is this irony, or is it sincere? This must be high courtesy. We have mistaken this man. We are all safe with him. This is no dark and cruel Gloster. Look you! Hear him speak again:

"My lord of Ely, when I was last in Holbern,
I saw good strawberries in your garden there,
I do beseech you send for some of them."

The Englishman loves beef, and my lord Bishop of Ely doubtless had "land and beeves" and "kept a farm and carters," and possibly he owned a trout stream or a salmon river on his estate. Why did not Gloster make some pleasant allusion to the savory round at the country dinner at Holbern, or recall some sport in angling? It would have been quite as easy. Ah, but he was among the epicures of the court that day. The times were grave. The highest stroke alone could kindle their imagination and shift their attention from him a moment while he collected himself for his coming tiger-spring out of the jungle of his difficulties:

> "I saw good strawberries in your garden there;
> I do beseech you send for some of them."

This was the master touch of magic. The court, the crown, the recent death of King Edward, the coronation of the prince, were all forgotten. The scene before them had faded, and their minds were fixed upon that rural, peaceful, happy scene where grew "good strawberries;" and they were "his pipe to play what stop he pleased." Even the wily Buckingham is the first to stalk towards the trap that sets for all who are or may be in Gloster's way, and which is to spring upon him soon, though he run from it, as one of the victims next in the order of death. Who could not be diverted from the grave affairs of state by the introduction of such a theme? Who would suspect the motive of Gloster behind the devilish ingenuity of such a suggestion at such a time for such a purpose?

> "Come into the garden, Maud."

English poetry, from Chaucer and Spenser to Tennyson, blooms in the garden. Shakespeare is full of it, and we turn to him once more. The orchard, the tree garden, the flower garden, is the scene of choicest hospitality, of the finest love passages, the drollest fun, and, in one case, of the darkest tragedy—a brother's murder.

"Now," says Justice Shallow, in Henry the Fourth, proud of his own handiwork among the apple trees, "Now you shall see mine orchard, where in an arbor we will eat a last year's pippin of my own graffing with a disk of caraways and so forth." And in the "Merry Wives of Windsor," Sir Hugh Evans, the Welsh parson, hastens to reach the last course of the dinner, "for there's pippins and cheese to come."

Where in the drama is there a finer scene than the festival of the sheep shearers in the "Winter's Tale," when Perdita, "the prettiest low-born lass that ever ran on the green-sward," comes among the guests with gifts of flowers and chatters of "rosemary and rue, grace and remembrance," the flowers of Winter? One might fancy that Thomas Andrew Knight, President of the old London Horticultural Society, had lived two hundred years before his time, and stood at Shakspeare's shoulder when this scene was penned to teach a lesson in cross-breeding of flowers, and in grafting tender cions on hardy stocks, and put it into the dialogue between Perdita and Polixines. She will have none of the carnations and streaked gilliflowers, will this pure maid ; they are not true to the conventionalities. She has heard

" There is an art which in their piedness shares
With great-creating nature;"

forgetting in her own fidelity and innocence what the wisdom of Polixines reminds her of, that

* * Nature is made better by no mean ;
But nature makes that mean, so o'er that art
Which you say adds to nature, is an art
That nature makes. You see, sweet maid, we marry
A gentle cion to the wildest stock,
And make conceive by bark of baser kind,
A bud of nobler race. This is an art
Which does mend Nature. Change it rather; but
The art itself is nature.''

Now, she tells them of

"Daffodills,
That come before the swallow dares and take
The winds of March with beauty; violets dim,
But sweeter than the lids of Juno's eyes,
Or Cytherea's breath; pale primeroses
That die unmarried ere they can behold
Bright Phœbus in his strength,
* * * Bold oxlips
And the crown imperial; lilies of all kinds,
The flower-de-luce being one."

Under the inspiration of these treasures of the garden, linked to love and hospitality and the admiring eyes of Florizel, she wonders at her own mental exaltation, and thinks the unaccustomed dress they have put upon her as mistress of the feast has become a robe of magic:

"Sure this robe of mine does change my disposition."

And Florizel, influenced by the same enchantment, ascribes the charm to her :

* * * "What you do,
Still betters what is done. When you speak, sweet,
I'd have you do it ever. When you sing,
I'd have you buy and sell so; so give alms;
So pray ; and for the ordering your affairs,
To sing them too."

And where, in all literature, is there a finer compliment to womanly grace than this, or one-voiced in honester admiration ?

" When you do dance,
I wish you a wave of the sea that you might ever do
Nothing but that!"

There is such a charm to me in Shakspeare's gardens that I hate to leave them; but with one or two more references, I will pass them by.

The crime that drapes the pall of tragedy over all the scenes of Hamlet has a darker hue from having been done by taking advantage of the slumbers of the King of Denmark in his orchard, as witness the revelations of the mailed ghost:

" 'Tis given out that, sleeping in mine orchard,
A serpent stung me ; so the whole ear of Denmark
Is by a forged process of my death
Rashly abused. But know, thou noble youth,
The serpent that did sting thy father's life
Now wears his crown !"

And poor Ophelia, in the same tragedy, heart-broken and crazed by the distraction of her royal lover, and the cruel fate that makes him by a sword-thrust intended for the fratricide king the slayer of Polonious, her father ; how many tears have blotted the page where she prattles in her madness, of her flowers, and running over the list in her wrapt, wild fancy, sighs at last—

"I would give you some pansies, but they
All withered when my father died!"

I must beg to be excused from quite so much as the popular admiration for another garden scene in Shakspeare, where, though

" Orchard walls are steep and hard to climb,"

young Romeo reaches the garden of the Capulets, and looking up into Juliet's eyes, declares that—

"Two of the fairest stars in all the heavens
Having some business, do entreat her eyes
To twinkle in their spheres, till their return."

This and the dialogue that follows is rather stilted ; the passion too tropical for Shakspeare's work, and suggests the idea of interpolation or patchwork—part Shakspeare and part Italian; but as the play proceeds we have Mercutio, Friar Lawrence and the ragged apothecary, Juliet's grief and Romeo's despair at the separation, their fidelity to each other in life and death, and gem after gem immortal in quotation, which bear the genuine stamp of the great master's mind.

To change the scene, here are Sir Toby Belch and Sir Andrew Aguecheek waiting in Olivia's garden, in Twelfth Night, to punish the supercilious Malvolio with Maria's device about the forged letter. There is nothing particularly horticultural about this, only in the location of a very practical joke, which all but the victim in yellow stockings and cross garters can enjoy; but it reveals the garden as a good place for social fun; and when Malvolio who has been captured by the snare laid for him, loftily reads in the letter:

> "Some men are born great, some achieve greatness, and some have greatness thrust upon them,"

We realize that the greatness that is thrust upon him is no boon, and we can moralize that if we are born great it is our inheritance, if we achieve it, it is our just due, but if thrust upon us, we had better refuse it as an ill-fitting garment of little comfort and no honor.

In poor old Scotland the garden does not seem to flourish as well in literature. There is more of clanging swords and waving banners, the pibroch scream, and the defiance of clans echoing from glen to cliff. Yet even here the rose in her highland home is Queen of Scots, and she is the mother of our best and hardiest garden pets of the rose family. Here too the yellow rose was once the highest badge of honor that could be conferred by king or queen. I think there must be Scotch blood in my veins, for nothing else in the rose garden pleases me so well, nothing else is so stately in its form of growth, or contrasts so well with surrounding color as the Scotch yellow rose, parent of its close copy the Yellow Harrison, and, too, nothing else is so hardy. Then the wild stock of the garden is all hilarious in Scotish poetry—the birds, the trees and the flowers; and who can think of them without recalling

> "The fragrant birch and hawthorn hoar"

that sheltered "Highland Mary." Take out

> * * * "the mavis singing
> His love song to the morn;"

the "bonnie lark"

> "When upward springing, blithe, to greet
> *The purpling East;*"

or the birds of "Sweet Afton,"

"Where wild in the woodlands the primroses blow,"

and these four lines from one of Burns' songs:

"The lavrock shuns the palace gay,
And o'er the cottage sings;
For nature smiles as sweet, I ween,
To shepherds as to kings;"

or this also from Burns—now mark it:

"*The feathered people* you might see,
Perched all around on every tree,
In notes of sweetest melody,
They hail the charming Chloe!"—

This is poetry; there is not a finer verse in the human language. We sometimes hear one speak of getting *down* to the level of the beast. One who gets up to Burns's level when that inspiration flashed upon his mind—"*the feathered people*"—has got to *climb!*

"Perched all around on every tree!"

Behold the blackbirds, the robins, the brown thrushes—our American mavis, for even the thrushes are social if you court them well—all the social birds of spring or summer—what else are they up there in the trees for but to greet the little maiden in white frock and bright ribbons, and gaily trinked with flowers as she dances about the meadow or the lawn?—

or forget when

"On the briar the budding rose
Still richer breathes and fairer blows;"

or

"The woodbine in the dewy weet
Where evening shades and silence meet,"

or the

"Wee, modest, crimson-tipped flower,"

that in the "Lines to a Mountain Daisy" inspired our bard of nature with a poem whose every line is a gem as clear as—

"The dew-drop clinging
To the rose just newly born;"—

and how much less there would be to make the appreciative gardener's thumb-marks on the well-worn leaves of Scottish poetry.

Time will not permit us now to wander longer in the gardens of literature abroad; nor even to stop and trace the influence of the garden upon American life—we can only glance at it. In literature, our poets who have attained the highest rank and the greatest fame, are the most reverent students of nature and the best lovers of the garden. Longfellow and Bryant,—how much and how aptly we could quote from them!—and he whose quaint fancies pictured Hulda and

> "The apples she was peelin'"

and to whose mind as he thought of this nice country girl,

> "The dogwood blushin' by the brook
> Weren't modester nor sweeter,"

has recently had bestowed upon him the highest literary honors yet conferred on any American citizen in a foreign country.

Were you to seek our greatest American historian in the summer season, you would find him in one of his rose gardens at Newport or Washington. A new fact in history would be hardly more interesting to him than a new beauty or an improved fragrance in a rose.

Finally, what is the sweetest dream of the man of affairs as he looks forward to the close of his struggle for fame or wealth and prepares for the quiet and peace of declining years? Is it not to retire, and amidst rural employments wherein the garden and the companionship of books and chosen friends shall occupy his time, repay himself for the mental starvation of years of enforced and ill-assorted toil. Happy for such a man if he join the Horticultural Society and learn how to take care of his garden while there is yet time. To such a man, equipped by the study of nature—and here I quote again from our old friend Solomon—

> "To know how the world was made and the operation of the elements;
> The beginning, ending and midst of the times;
> The alterations of the turnings of men, and the change of seasons;
> The circuits of years and the positions of stars;
> The nature of living creatures, and the furies of wild beasts;
> The violence of winds, and the reasonings of men;
> The diversities of plants, and the virtues of roots;
> And all such things as are either secret or manifest;
> Loving the thing that is good;"

Becoming by the influence of these employments and these studies,

> "Kind to man, steadfast, sure, free from care,"

Life must proceed to its close as calmly as the current of the gently flowing river; and the final transition to that undiscovered garden where fruits and flowers immortal grow, be but the passing into the peaceful slumber of one who

> "Wraps the drapery of his couch around him
> And lies down to pleasant dreams."

The grandest thing for our contemplation on this earth is that old age that having this wisdom enjoys in retirement the sure reward of a clean unselfish life in harmony with nature, and which approaches the restful dissolution of the body with no anxiety lest some opportunity may pass overlooked of doing good.

American Horticulturists will not look far nor think long to find, perhaps more than one figure like this, declining on their horizon.

A vote of thanks was tendered for the "Garden in Literature," after which the society took up the discussion of small fruits, for the remainder of the evening, and in response to a call from R. Porter, Mr. Golden, of Plainview, gave his experience with blackberries. He tried for sixteen years to raise the Lawton, and had a time of it, and got one berry. He then tried the Taylor, and got one crop in five years ; a full crop, that was last year. They are now frozen down to the snow line. He thinks they are dead, but his wife has hopes.

President Harris. I am having good success with the Snyder and Stone's Hardy. The latter is more easy to protect, the bushes are not so stiff and upright in growth as the Snyder. O. M. Lord, of Minnesota City has quite a plantation of Stone's Hardy, and protects them by taking a spadeful of earth from one side of the roots, then bending down the canes and covering with earth. They bear well and pay well. Ancient Briton is a large berry, but not so proliffc as some of the others. I think some improvement might be made by selection and cross breeding with the wild blackberries.

Truman M. Smith. Several gentlemen of St. Paul are cultivating the native trailing blackberry.

CURRANTS.

Secretary Gibbs. We have heard for many years, principally by way of nurserymen's catalogues, of varieties of currants that are larger than our common Red and White Dutch, and said to be productive and good ; but I have watched the markets for them in vain, till last summer I saw for the first time the proofs of their existence. This was at St. Paul. In the city markets there I saw abundant supplies of very large and handsome red currants on sale, day after day, and I would like to know what they were, who raised them, and all about them.

Truman M. Smith. The large currants in the St. Paul market which Secretary Gibbs refers to were the Prince Albert. I have grown them at my place on Dayton Bluff, and have received more profit from this variety than from all other kinds together. The only objection is to its color. It is rather pale, but being a large currant, very prolific *and ripening late*, it always sells for a good price. Stewart's Seedling is promising well, and I think much of it so far. Ripening before the Prince Albert, the two varieties go well together to prolong the market.

C. L. Smith. Do you know anything of Fay's Prolific currant.

Truman M. Smith. Too high priced. In reply to a question: White currants are not in much demand in the market, they are only wanted for table use. Another question: Do you have the currant worm? Answer. Ordinarily, yes; but it will not do much damage if you keep the ground clean Recurring to the Prince Albert currant: It ripens just in time to come in right after strawberries.

The Secretary. Have you the plants to sell?

Mr. Smith. That is out of my line, as I am a fruit grower, not a nurseryman, but I might spare a few.

Mr. Smith spoke as follows of other fruits, in reply to questions as to his knowledge and experience:

Cuthbert raspberries have sold at twenty-five and thirty cents per quart in St. Paul, when Philadelphias would only bring twelve and one-half to fifteen cents. Turner's sell better than Philadelphias.

I consider the Delaware the best grape out of forty or fifty varieties I have tested. Concord comes next, for profit, and, in small quantities for home use, the Northern Muscadine is good. It is excellent for jelly, before fully ripe, but when ripe, will drop from the stem.

MORNING SESSION.

Third Day, Thursday, January 17th.

The session opened with music by the University Glee Club.
The following paper was then read by W. S. Mesmer:

THE WAUPACA COUNTY SEEDLING APPLES.

By William A. Springer, of Fremont, Wisconsin.

I have been asked to give an account of the seedling apples produced in Waupaca county, Wisconsin, which have been noticed more or less in western horticultural reports of the last few years.

The Wolf River takes the lead. It is the oldest of the lot, and has had the most general trial. The old original tree, from seed I planted thirty-two years ago, is still perfectly healthy, although it stands in the most trying place, where its roots touch the waters of the Wolf River. It has not missed a crop since 1862. The young trees are all doing well so far as I know. I have no trees that gave me so many apples this year as my twelve-year-old Wolf Rivers.

THE WRIGHTMAN ORCHARD.

This seedling orchard is at Weyauwega. The trees are all healthy and nearly all are good bearers. Ten of the varieties were exhibited this winter at the Wisconsin meeting. One of them, called the

Weyauwega, has borne from a fair to a heavy crop of fruit every year for the past fifteen years. The apple is a good keeper. The Wrightman's Blush is an excellent keeper and a good bearer. The Flora the same. The Martha is a fair bearer but a slow grower. The Waupaca, although a large, beautiful apple, and a great grower, is not a great bearer. The other varieties not named are all excellent trees and good bearers.

THE BENNETT ORCHARD.

This is at Royalton. Many of the varieties are very choice. Ten of these, also, are exhibited this winter. Every tree is perfect and all good bearers. Mr. Bennett has one of the best orchards in the county. It stands on a south-easterly slope. His seedlings are mostly numbered. So I will say nothing now of any except the Bennett, which is a beauty, of excellent flavor, an abundant bearer and one of the best market apples he has.

THE WHINNEY ORCHARD.

M. A. Whinney, at Lind, has about ten varieties of seedlings. All the trees are healthy and are fine bearers. The Helen is a keeper, and a free bearer. His orchard is on high ground, but level.

THE GIBSON ORCHARD.

This is also at Lind. Mr. Gibson has many very nice apples and good trees. His Sprawler, as friend Plumb called it, is a keeper, a good apple and a perfect tree.

THE STREET ORCHARD.

This is a seedling orchard set out thirty-three years ago, numbering one thousand trees. Many of them are choice apples and good trees.

THE BALCH ORCHARD.

This is at Weyauwega and numbers over three hundred trees, many of which are great bearers, and splendid trees, and the apples good keepers. Ten varieties were shown at the Wisconsin meeting at Green Bay, and Mr. Balch has to-day in his cellar more apples than any other man in the county. Though they lack color, and in size are not up to others of which I have spoken, his trees on the whole are a success.

THE HICKMAN ORCHARD.

This is in Fremont. It is thirty-five years old, and the trees perfectly hardy. From one of the trees Mrs. Hickman tells me they picked five barrels of apples this fall, and then shook off more than another barrel. Two of the barrels were kerosene and the others salt barrels. It bore a fair crop the year before. Although it lacks color, it is a very good tree to have this year when apples are such a general failure. This orchard stands in low, level ground.

GENERAL REMARKS.

I have never seen so many good seedling apple trees in any other quarter as these and several other orchards I might mention in Waupaca county. Our location is pretty far north, above 44°; far enough in the interior to be beyond the ameliorating influence of any large body of water; some of the orchards are on high lands with full exposures, and some on lowlands; and if cold weather is any test, we got 42° below zero last winter. Then why is it that these seedling orchards are living and thriving when so many of our standards have failed? The old Wolf River tree is alone, where three hundred other trees have died, and it is the only good tree left in the orchard where it is standing. *In every instance the seeds from which these trees were grown, were taken from fruits grown far to the north, from Maine, Northern New York and Canada east, or from trees grown here.* I think the source to look for hardy apple trees is the planting of seeds from selected northern fruits; and such seeds for root grafting are better than inferior sorts from the cider mills or any seeds from the south.

In our experiments in Waupaca county we have had many seedlings that showed tenderness and have died from time to time. By a process of selection, and propagating by root grafting, and then setting out, we have preserved the best, and obtained good orchards.

When I first came to this county, thirty-four years ago, I brought trees with me. I set the first apple tree, and raised the first apples in the county. Many of these trees are alive and healthy, and bore well this year.

DISCUSSION.

The Secretary. This paper shows the value of intelligent effort to grow seedling apples, that is by selection of seeds of the best hardy sorts grown in the extreme north. The Wolf River Apple has been fruited several years in Iowa, Wisconsin and Minnesota. Here are samples of it, contributed by Mr. Springer, and by S. Barter of Markesan, Wisconsin. There is nothing larger in average size in our entire pomology, and its form and color are very handsome. Its red color and glossy finish are almost equal to our Wealthy, perhaps when grown here we shall find it quite as handsome. This tree is evidently of Russian blood. For years its fruit was declared by experts, whenever it made its appearance, to be the Alexander, an apple of admitted Russian origin in all the European and American catalogues. It is now admitted by all to be a distinct variety. Its distinguishing marks from the Alexander are thicker leaves and red buds. So says Mr. G. P. Peffer. It seems to have the general adaptation of the Duchess, and is said to be one of the few sorts that do well in low, sandy soils. Its quality is sub-acid and texture a little coarse, but it is a good cooking apple and fair for dessert; and if all that is said of the merits of the tree is true, it must prove a profitable market apple for Minnesota. I will add that it is also said to be at home as a top graft on Whitney No. 20.

THE NORTHWESTERN GREENING.

While speaking of the Wisconsin seedlings I wish to call attention to another one, the Northwestern Greening, samples of which I have here from the Green Bay exhibition. This is a medium to large oblong green apple. It is a long keeper and of excellent quality every way as a sub-acid cooking and dessert fruit. It is backed up by good testimonials as one of the sorts that is worthy of general trial. It was found in the north part of Waupaca county in 1872 by E. W. Daniels, of Auroraville, who bought the right to cut cions. The old tree is said to be dead; but many of its progeny are scattered about the State. It is said to be a thrifty and symmetrical upright grower, and to have the familiar ear marks of extreme hardiness. A great deal seems to be expected of it in Wisconsin. Here are specimens of its growth and union as a top graft on Transcendant, put in last spring. Mr. Plumb knows the variety well. I have given this much of a notice of it here on condition that Mr. Daniels will furnish a few trees in the spring for Mr. Gideon's experimental station, and to Professor Porter for the new University farm for trial; and while on this topic will also say that Mr. Springer will also furnish freely for the same purpose cions of any of the seedlings reported on by him. him. My own opinion is that just as fast as we find adaptation to our climate in any of the new seedlings, the next thing we discover will be that they are of Russian blood, just as surely as we have come to know that a negro or a mulatto is an African whereever he was born; but they may have improved quality from crosses they have got, and perhaps a little improved adaptation from being seedlings; and this propagation and trial should be encouraged hand in hand with direct importations for adaptability.

Before closing this topic, here is a letter from Mr. Springer, which I will read :

LETTER FROM MR. SPRINGER.

FREMONT, WISCONSIN, January 4, 1884.

Mr. Gibbs:

There is one thing I would like to add, there cannot be too much care in selecting seed. Some say it makes no difference, but I am certain it does. Mr. A. V. Balch soon after he came to this country, (I think 33 years ago) got a barrel of apples from the old home in Northern New York. He saved and planted all the seed; they were seedlings, a large green apple. Now all his apples that he has are light colored except one, which is very dark red. He has more than one hundred bushels at this date, most of them excellent winter apples.

Now another instance: Mr. Cary Date settled here in 1851; whenever he got a high colored, hardy kind of apple he would save the seed, and he always had a few rows of seedlings from which he would select the most promising young trees and set in orchard. In this way he had a model orchard. He has the greatest per cent. of dark red, large winter apples, I ever saw in one orchard. His orchard is on land rather low, and friend Plumb's rule will not apply to this orchard at all, any more than it will to the McWhinney orchard, which is on level ground. Mr. McWhinney's orchard was planted from one kind of seed by John Baxter. The apples of this orchard are mostly large, well colored apples. This orchard is not as old as the others, and was selected from seed that grew here. I believe in selecting seed for planting orchards as much care should be take as in selecting seed corn or seed wheat—get the best.

Weather cold to-day; 28 below zero this morning. I wish I could attend your meeting; will try to another year with our apples.

Yours respectfully,

WM. A. SPRINGER.

President Harris. It is usually claimed that the color of fruit is imparted by the male parent.

The Secretary. The rule does not seem to be well defined, either in plant or animal life, at least the facts are not well enough understood to warrant any one in laying down a law in regard to it; but those which Mr. Springer mentions indicate prepotency on the mother side to stamp the color; the seeds of the green apples showing lack of color in the offspring; those of the high colored ones transmitting plenty of color. The Pewaukee apple has strong markings in color of its mother, the Duchess, and also some, apparently, from its father, the Northern Spy; its form takes after neither, but seems to revert far back, while its quality is not defined by either, though superior to the Duchess; its season is the same as the father; and the tree is the mother again in its thick, woolly leaf and freedom from rust and blight, though less winter hardy. The Gibb crab is all mother in color—not a trace of the Fall Greening, its father, in this respect. It is a bright, glossy, lasting yellow. It was from seed of the oblate yellow Siberian, fertilized by Fall Greening. Mr. Peffer is a man who is pretty sure of his facts, and I find that our best horticultural authorities in all parts of the country have confidence in what he states, and have high respect for his conclusions. He has originated not only the Pewaukee apple and the Gibb crab, but several others by hand work in propagating seedling fruits. It seems pretty sure that the constitution or hardiness comes mainly from the mother, in tree life, and the keeping quality of fruit from the father. Aside from this, it is safe to select for seed planting the sorts that are best in all other respects.

Mr. Plumb had known the Waupaca seedlings for many years. He thought their success was due largely to aspects, elevations and soils, where they grow. Only one of them showed after years of trial any general adaptation in Wisconsin. This was the Wolf River. He admitted that the owners of these seedling orchards had plenty of excellent. handsome apples.

The Secretary. The value of this report of Mr. Springer's, lies mainly in its showing of the fact that by selecting seed of good, handsome apples, these farmers out there on latitude nearly 45° had succeeded in supplying themselves with fruit. It is an encouragement to others to plant selected apple seed.

Mr. Pearce. I have the Wolf River growing on my grounds at Lake Minnetonka. The quality of the apple is not as good as the

Wealthy, but it is large, showy and productive; the tree is hardy and has not blighted.

Mr. Plumb. The Northwestern Greening of which Secretary Gibbs has spoken is one of the new sorts of which we have high hopes in Wisconsin.

Mr. Plumb having been announced on the program for a paper on "Adaptations in Fruit Growing," then addressed the society very ably and acceptably on that subject. At the time of going to press a copy of his address had not been furnished. If received in time, it will appear in the appendix.

Colonel Stevens. In reference to one remark of Mr. Plumb in his address, I will say that late frosts in the spring and early frosts in the fall, are not common in Minnesota, and such a thing as June frost is unknown.

FLORAL OFFERING.

At this point in the proceedings a beautiful basket of cut flowers was received from R. J. Mendenhall, of Minneapolis, and presented to the society, and a vote of thanks was returned therefor.

INTRODUCTION OF CHARLES LUDLUFF.

Secretary Gibbs. Mr. President: We had before the society yesterday for the first time one of the noted fruit growers of Carver county, and gave him a cordial greeting. I see in the audience over there in the corner another one of them. I found him as I did Mr. Peterson in my searches for apples to take to Philadelphia. Mr. Charles Ludluff, will you please rise and let me introduce you? Mr. President and fellow members, this man is a farmer who lives near the village of Carver. He raises more fruit than any other man in Minnesota not a professional nurseryman, and has been at it for over twenty years, in apples, grapes, and everything. He gave us about fifty varieties of apples for the Philadelphia collection, and in a favorable apple year we we could draw on him for one hundred varieties, I presume.

Mr. Sias. I know, Mr. Ludluff's work in fruit-raising, and am glad to see him here. Our Secretary has not overstated the value of his services.

Mr. Emery. The work of these farmers in experimenting with fruits so largely and liberally as Mr. Ludluff has done is of great value, and they deserve to be classed and remembered as benefactors. Especially should we as a society welcome them among us, and I, therefore, move that, in consideration of long and distinguished service in horticulture, we tender Mr. Ludluff, as we did yesterday Mr. Peterson, an honorary life membership in this society.

The motion was adopted by unanimous vote.

Mr. Ludluff. Mr. President: It is a great honor that is here done me, and I thank the society for it. I feel an interest in your society. You are doing good work in pomology. The greatest disadvantage I see at present is the want of young men to take up the experiment in fruit raising. We must arouse them in some way, and teach them to love it and profit by it. This can be done if we try to organize societies and have meetings at home. I will do what I can for this in Carver county, and encourage our people hereafter to come to the State Horticultural meetings and read your reports.

Mr. Ludluff's paper was then read by the Secretary as follows:

REPORT ON PLUMS, CHERRIES AND APPLES TESTED IN CARVER COUNTY.

BY CHARLES LUDLUFF, OF CARVER, MINN.

To the State Horticultural Society of Minnesota:

Your Secretary asks me for an account of the cherry tree found by him and F. G. Gould in the garden of Andrew Krause, near Waconia, and for some facts about plums and apples I have tested in this county, and which were in the Philadelphia exhibit.

THE OSTHEIM CHERRY.

That cherry is the Ostheim Weischel. The original stock was sent me by a pomological friend in Germany about twenty years ago in the shape of root sprouts, and since that time I have propagated them in the same way, and had them tested in various parts of Carver county. It is a good cherry for our climate, as the tree is hardy, a great bearer, and the fruit in favorable seasons is large and of excellent quality. Its color is dark red — very dark when ripe; form oblate; stem long; flesh, tender, sweet, sub-acid, refreshing; nearly a free stone. The tree grows better dwarf than high standard;* best soil for it is a clay with mixture of sand. If grafted, it must be on sweet cherry stocks; is a failure on the sour.

A GOOD NATIVE PLUM.

The plum I sent is a native, large, dark in color, and when fully ripe, juicy and very sweet; skin thin; worthy of cultivation by every one who has a little garden.

The time we sent our fruits to Philadelphia for the American Pomological Society, was eight or ten days too early, on account of the lateness of the season, to show many of them to advantage in size, color and flavor.

RUSSIAN APPLES.

I have planted out from time to time in the last ten years the following varieties of the Washington Catalogue: †

Nos. 183, 190, 202, 204, 214, 220, 236, 260, 262, 265, 295, 304, 330, 337, 343, 354, 367, 369, 370, 372, 382, 385, 387, 407, 430, 439, 447, 451, 458, 475, 544, 551, 569, 585, 595, 962, 965, 971, 979, 984, 985, I have root grafted trees of these, some of the older ones have borne fruit; both tree and fruit very good, but mostly summer apples. What the most of them will be I cannot tell, as they are now too young. I grafted many at first in the tops of old crab trees, and they have generally proved failures, as there is no congeniality between the cells of these different races of trees, and the sap is obstructed in its passage. I have done with top grafting. In all I think not much of these Russian kinds. The most bear summer and early fall apples. Some are very small and sour, and of such poor ones we have more than enough already. Besides many of them are poor growers. The best use we can make of these Russian apples is to plant their seeds and raise a new stock. There may be some improvement in quality in this process, and the seedlings so produced are liable to be hardy stocks to use in propagating the best of the Russian varieties.

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*NOTE BY SECRETARY. The dwarf must be a marvel of beauty then; for the standard one at Mr. Krause's place is the handsomest cherry tree I have seen in Minnesota.

†NOTE BY SECRETARY. Names omitted here and numbers only given, in order to economise space, as the full catalogue is to be printed to make a record of numbers and name, in the Secretary's Portfolio.

OTHER NEW APPLES.

Now I will give you a short description of some other apples which have not heretofore been brought to public notice. First the German Rambo and the Rembacker.

In 1854 I made a visit to the old country and brought home with me cions of two hundred varieties of apples. I root grafted them that winter and in the spring of 1855 planted them out in nursery rows. They grew well through the summer, but in the spring after, half of them were dead. The second spring they were all dead except the German Rambo and the Rembacker. They were sound and good for transplanting, and so they stand with me to-day. The German Rambo ripens after the Duchess of Oldenburg, but keeps longer. Its form is like the Duchess and it is just as large. The color is a straw yellow, with bright carmine on the sunny side. The stem is short, and at its base in some of them is a protuberance like that of the apple called the Roman Stem; flesh white; flavor spicy. The tree is spreading in form, not a good grower for the nurseryman, and bears some fruit from the terminal buds, leaf large, strong-ribbed, woolly underneath and hardy.

The Rembacker, a brother of the German Rambo, has gone through all the winters since 1855 uninjured. The tree is slender in form like the Willow Twig, and a slow grower; bark yellow. Bears in alternate years. The apple is of medium size, green with red stripe on sunny side. Flesh white like Fameuse; flavor vinous; keeps till spring.

The Robinson is a seedling apple, raised by James Robinson of the town of Dahlgren, in this county. The tree is twenty-five years old, and a slender grower; young wood, brown; buds large; leaf large and coarse; fruit large, oblate; stem short; hangs fast on the tree; color light red with dark red stripe, and white spots over the surface; flavor vinous, growing sweeter in the spring; tree is hardy.

The Gibb apple is a hybrid. I got this from our friend, the veteran pomologist, G. P. Peffer, of Pewaukee, Wis., several years ago. The tree is a slow grower but very good bearer. Cions are woolly towards bud at the tips; buds and leaf large; fruit medium to large for a crab; color yellow; some specimens have a red cheek on the sunny side; flesh yellow; flavor vinous, refreshing. Good for cider and wine; season late fall; tree very hardy.*

The Barkeeper apple is a variety I got from my old friend, that other veteran pomologist, Peter M. Gideon, of Excelsior, several years ago. I have it as a top-graft only. Cannot tell what it will be when root grafted. Looks like a fast grower. The fruit is large; color, grass green all over, with white spots; stem short; hangs fast on the tree. Flesh, coarse; flavor vinous; tree very hardy.

In reply to a question, Mr. Ludluff said his orchards were on deep black soil with clay subsoil. No shelter except gray willow on the north.

Mr. Plumb was in favor of windbreaks, but not of close shelters for orchards.

FINANCIAL MATTERS.

A report was presented by the finance committee embracing the following points, given from memory by the Secretary, as the papers could not be found after the adjournment of the meeting.

1st. Finding the accounts of the Secretary and Treasurer agreeing and correct as presented.

2d. Reciting a by-law in the Annual Report of 1878, limiting the executive committee to $50 per year in the current expenses of the society, and alleging that this by-law had been violated in the expenditures for the collection and exhibition of fruits at the meeting of the American Pomological Society, in September last.

3d. Intimating a tendency to extravagance, the spending of money because we had it—a tendency that the committee thought needed checking.

The report was signed by G. W. Fuller, A. W. Sias and M. Pearce.

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* NOTE BY SECRETARY. This apple was originated by Mr. Peffer from the oblate yellow crab, fertilized by Fall Greening apple. Its merits were first recognized by Charles Gibb, of Abbottsford, Canada, who selected it as the most promising at the time of a row of seedlings shown him by Mr. Peffer. Hence its name. The tree has never been known to blight so far as records have been obtained, and the apple has, besides the good qualities named by Mr. Ludluff, the faculty of staying firm outside and in, and holding its bright, yellow color all through the fall and early winter. It must be a valuable crab for market, and like the Whitney No. 20, a profitable one to raise for selling to the dryers. It was one of the three most attractive crabs in appearance on our tables at Philadelphia.

Mr. Pearce arose and stated that he dissented entirely from all of the report except that part agreeing to the correctness of the accounts of the Secretary and Treasurer. He was a member of the executive committee; was not present at their meeting in August, but approved their acts. He did not see how any committee could have acted differently.

Mr. Underwood. As chairman of the executive committee, I will say that the finance committee appears to have overlooked the fact that the action of the executive committee was fully authorized by resolution of the society last winter, which will be found on page 137 of the report of 1883, and also that the understanding was the same at the meeting in June last, without a dissenting vote at either meeting. If anybody has violated this old forgotten by-law, adopted when we had no funds but membership fees and not much of that, it is the society itself, not the committee; and it has been doing this outrage on itself every year for three or four years past, ever since we got our State appropriation.

What does the finance committee think we could have done in this Philadelphia business, anyway, with fifty dollars? Or how could we have got out our premium lists and paid our awards? If this report is made in earnest, and anybody is really dissatisfied, the members of the executive committee are ready to foot the whole bill and take it all in stock in the medal.

C. L. Smith. It appears that the cost of the collection and exhibit, delegate's expenses, etc., is less than $400, and of this $200 was paid by the Governor. Instead of any idea of extravagance, I have often heard expressions of surprise that so much could have been done with so little money.

Col. Stevens. The general opinion is that the whole matter was well devised by the executive committee, and well and economically managed by Mr. Gibbs. The State is proud of it, and delighted with the honors paid us in the award of the medal. It is worth to the State of Minnesota all that this society has cost in seventeen years.

Truman M. Smith. If there is any fault it is with the society.

Mr. Gould read the resolution of last winter referred to by Mr. Underwood.

C. L. Smith. I move that so much of the report as approves the accounts of the Secretary and Treasurer be adopted, and the rest of it be stricken out.

Mr. Fuller. I will say for the committee that we have acted conscientiously in this matter. We found the by-law, and we also had before us an expenditure greater than $50 per year, and felt it to be our duty to call attention to it.

The motion of Mr. Smith was then unanimously adopted, and it was further voted that the by-law referred to be amended by inserting $500 in place of $50, and that the executive committee be authorized to expend that amount annually, at their discretion, for the current expenses of the society.

Mr. Mendenhall. In order to make the record complete, and promote good feeling in this matter, I offer the following resolution.

WHEREAS, This Society has made an exhibition of the fruits of Minnesota at the recent meeting of the American Pomological Society, and whereas the Wilder Silver Medal was awarded the Society thereon; therefore,

Resolved, That the action of the executive committee in authorizing the expenditures that were made, and of our Secretary in his capacity as delegate, be indorsed and approved.

The resolution was unanimously adopted.

AFTERNOON SESSION.

Third day, Thursday, January 17th.

Music by the University Glee Club.

Prof. Hall's address having been made the special order for this afternoon, was then delivered as follows:

[See appendix for this address.]

Prof. Folsom. Can you give us something authentic on the necessity of tree planting on the prairies to induce greater moisture?

Prof. Hall. It is the universal observation that in regions of forests the rainfall is greater in the annual average, more evenly distributed, and the climate more equable. The planting of trees is certainly recommended to bring about these desirable results. Nothing conserves moisture so much as vegetation. Nothing collects and holds it better than a forest. Every leaf is a thirsty throat, asking water. Blue-stem among the grasses indicates an increase of moisture.

Secretary Gibbs. It is the opinion of scientists who make a study of forestry in connection with meteorology, that thirty per cent. of our western regions must be kept in forests in order to induce and equalize moisture sufficient for agriculture and to maintain our streams of water for navigable and manufacturing purposes and also to offset the waste of moisture consequent upon the destruction of the grasses by cultivation of grains and by the drainage of marshes. It is also believed that the yearly increase of devastating floods in our great river valleys and along the smaller streams—even in the dry runs of our bluff lands—is due to man's disturbance of the balance of nature by clearing the slopes at their sources and along their inlets, and some go so far as to assert that the unequal rain and snowfall, the cloudbursts and deluges that we hear so much about on the one hand, and the no less destructive, but less terrible drouths on the other hand, are due to this clearing of woodlands, destruction of grasses, and draining of marshes; increasing aridity of air being followed by lower temperatures, and this by sudden and enormous condensations of masses of moisture brought in by ocean currents, producing deluges of precipitation. These prophets of Nature have predicted for many years past (and appealed in vain to the government to prevent) such floods as that of last year and the year before on the Missouri and the Ohio, and worse to come. Already many of our small valleys in Minnesota and Wisconsin along the Mississippi river, which in the days of early settlement were the most sought after of all our lands, are now held by their owners with constant dread and peril of their lives or property; some homes once thought secure, already abandoned; while farmers who live above them on the slopes that feed these valleys are complacently allowed to go on clearing and smoothing the slopes and completing the ruin of their neighbors below, and hastening the time when they must leave their own lands for want of water, whose sources they have destroyed. Already it is said that the timber of the eastern slopes of the Rocky mountains has been nearly destroyed by the necessities of mining industries and the fires that are allowed to follow the axe of the woodman; and the terror of inceasing floods grows upon the people living in the Missouri and the Mississippi valleys in consequence, while year by year vast districts in these valleys are to become uninhabitable that nature designed for the richest and most productive abiding places of man. It does seem as if our people might soon begin to realize these things and demand of the general government an arrest of this mad work.

A vote of thanks was tendered to Professor Hall for his able address, and he was requested to prepare a paper for our next annual meeting on the subject of climatic influences of forests.

Prof. Porter called attention to the meeting of the State Amber Cane Association, to be held next week at the State University, especially to the expected lectures of Prof. Wiley, of the U. S. Department of Agriculture, upon new and improved methods in the manufacture of sorghum syrups and sugars, to be delivered before the Association. A cordial invitation was extended to all to attend the meetings.

The election of officers for the year 1884, was then proceeded with by ballot and resulted as follows, all the elections being declared unanimous:

President—TRUMAN M. SMITH, St. Paul.

Vice-Presidents—A. W. SIAS, Rochester; E. H. S. DARTT, Owatonna; F. G. GOULD, Excelsior; G. W. FULLER, Litchfield; A. H. REED, Glencoe.

Secretary—OLIVER GIBBS Jr., Lake City.

Treasurer—J. T. GRIMES, Minneapolis.

Executive Committee—President, Secretary and Treasurer, and J. S. HARRIS, La Crescent, R. J. MENDENHALL, Minneapolis, C. L. SMITH, Minneapolis, J. M. UNDERWOOD, Lake City, W. E. BRIMHALL. St. Paul.

A draft for new constitution and by-laws was presented by the Secretary, and on motion referred to R. J. Mendenhall, Wyman Elliott, G. W. Fuller, J. M. Underwood and A. W. Sias, as a committee to report at next meeting.

The following telegram having been brought in:

DES MOINES, Iowa, January 17, 1884.

To the Minnesota State Horticultural Society, in session at Minneapolis:

The Horticultural Society of Iowa sends greeting. We join hands with you in common endeavors to raise the standard of horticulture in our respective States.

J. J. WRAGG,
E. R. SHANKLAND,
Committee.

Was received with applause, and the secretary being instructed to return our greetings in the same spirit, answered as follows:

COLLEGE OF AGRICULTURE,
Minneapolis, Jan. 17, 1884.

To the Iowa State Horticultural Society, in session at Des Moines:

Telegram of this date received, and sentiments cordially reciprocated by the Minnesota Horticultural Society. We are BUDDING some of your ideas on hardy stocks.

OLIVER GIBBS, JR.,
Secretary.

Delegates were elected to other horticultural societies as follows:

M. Pearce, Oliver Gibbs, Jr., and E. H. S. Dartt, to the Mississippi Valley Horticultural Society, next week.

G.W. Fuller to the Iowa State Horticultural Society, next year.

A. W. Sias to the Wisconsin State Horticultural Society, in February of this year.

The Secretary stated that he should attend the Kansas City meeting as U. S. Commissioner for the New Orleans World's Exposition, and should not need to present any bill of expenses to this society.

The committee on the Secretary's report, submitted the following:

Mr. President and Members of the State Horticultural Society:

Your committee to whom was referred the recommendations of the Secretary have had time only to consider a few o the points presented, but so far as we have taken them up, agree as follows:

1st. That the sum of $100 should be appropriated annually for expenses of sending out our annual reports, until such times as we may have local auxillary societies to attend to their distribution.

2d. That some plan should be devised by the society or by the executive committee for increasing our membership, and also for the procuring and proper distribution of seeds and cions.

3d. That the Secretary's suggestions for extending our exchanges of horticultural reports, so that all our members can be supplied with reports of other societies, is approved.

R. J. MENDENHALL,
TRUMAN M. SMITH, } Committee.
EDWARD D. PORTER.

On motion the report was adopted.

EVENING SESSION.

Third Day, January 17th.

E. H. Cuzner was appointed librarian for 1884; $10 voted him for services since the death of Mr. Bowen to date, and $15 for book case and repairs in the library room.

Mr. Messmer then read the following paper on roses, the author not being present.

ROSES IN THE NORTHWEST.

By Samuel Barter, of Markesan, Wisconsin.

[This paper was read at the Green Bay meeting of the Wisconsin Horticultural Society, in December, and is reproduced here by courtesy of the Secretary, Prof. William Trelease, and by permission of the author.]

That roses can be successfully grown in every part of the Northwestern States is fully demonstrated by the experience of all who have been earnestly engaged in their cultivation.

Much has been written on the subject of roses, but most of the articles that I have seen published apply to their cultivation in the Eastern States, mainly to the state of New York.

I wish to discuss the subject from a northwestern standpoint, and what information I may be able to impart is given as the result of my own individual experience and observation.

Now that the summer and winter protection of the rose bush is no longer an experiment in this region, the wonder is, that so few of our homes are decorated and enlivened by the presence of this beautiful flower in their surroundings. Said a lady, when speaking of beautiful surroundings: "Whenever I pass by a home with beautiful flowers, I always think they are nice people who live there." This sentiment is doubtless recognized by us all, though perhaps not always so candidly expressed.

The multiplicity of names given to the different classes of roses such as Tea Roses, Hybrid Perpetual, Bengal, Bourbon, Noisette, &c., while they may be understood by the professional florist, are certainly very confusing to the amateur.

For the information of the general public, I prefer to class them as hardy and tender roses and subdivide them into three kinds, viz: the annual or June roses; the occasional bloomers (known as Hybrid Perpetuals) and the ever-blooming roses, the latter kind being nearly all too tender to survive our northwestern winters, when left in the ground.

The June roses and Hybrid Perpetuals are all hardy and can be easily protected in the winter—the same bushes continuing for a number of years to produce a rich abundance of beauty and fragrance.

I will name a few of the June roses that bloom only once in each summer. This includes all the moss roses, the yellow and white Scotch roses, Madame Plantier (the best of white roses) Seven Sisters, Cinnamon rose, Hundred leaf rose, &c.

The best of the occasional bloomers or Hybrid Perpetuals that have been grown under my observation are Louis Odier, Joseph, Paxton, General Washington, General Jacqueminot, La France, and Madame Charles Wood. These are the most profitable kinds of this class of roses to cultivate, as some of them will be likely to produce buds and blossoms continuously from June to October.

Of the tender roses known as "Ever Bloomers," there are many beautiful specimens. Perfect roses are often grown on young and very small bushes; they produce some exquisite gems of beauty during the summer, but the plants must be dug up and set in boxes of earth to be housed during the winter.

The following are the names of a few of the best kinds: Pearl-Des-Jardins, Madame Lambard, Etoile de Lyons, Malmaison, Safrano, the Palymantha or Miniature roses, Madame Wetcke, Marshall Neil and Dutchess-de-Brabants.

I have been very successful in the cultivation and protection of the above-named rose bushes. I have not the least fear of any of the hardy kinds being winterkilled. My mode of protection is very simple, and attended with but little trouble. Simply bend the bushes to the ground, secure them there with some stakes and cord, or lay some sticks of wood on them and cover over with straw.

They should not be covered too early in the fall. From the 1st to the 10th of November is the best time. One or two hard freezes will not injure them. My experience teaches me that they will safely endure a zero test in the Fall.

The bushes should be uncovered and straightened up in the spring, from the 1st to the 10th of April, each bush being tied to a stake or other support driven in the ground.

Rose bushes have been subjected to a test of temperature as low as 22° above zero, after being raised in the spring without injury. The mode of protection for the tender or ever-blooming roses attended with the least trouble is to keep them in flower pots or wooden boxes in the cellar in the winter, putting them in about the 15th of October and taking them out some time in April or the beginning of May. Set the boxes in the ground without removing the plants from them. The rosebush having few or no fibrous roots almost invariably loses its leaves by transplanting, and sometimes its life. The summer care and protection of rose-bushes of all kinds is attended with but little trouble if prompt attention is given them at the proper time. They thrive best in rows or beds. It is a good plan to spade up the ground in the spring between the rows and hoe a few times during the summer to keep out the weeds.

About the first of June a small insect appears on the leaves of the rose bush so minute at first that it can hardly be seen without the aid of a magnifying glass; but it grows rapidly and multiplies fast. It honeycombs the leaf, and, if appearing in sufficient numbers and left undisturbed, it will soon sap the life of the bush. This insect is known as the rose slug, and is the only real formidable summer enemy of the rose bush. It is a small worm, its natural growth being about one half an inch in length. This insect can be very easily destroyed, and as there is only one crop of them it does not require constant watchfullness. Many things are recommended for their destruction. It is said fine road dust will destroy them. White Helebore will kill them, but a little Paris Green mixed with water, in the proportion of a tea-spoonful to a ten quart pail of water and applied to the bushes with a whisk or sprinkler will act on the slugs like magic, generally destroying them all with a single application.

All kinds of roses can be propagated by layering. This is probably the easiest and best method for amateurs who wish to increase the number of their bushes for themselves or for the purpose of donating to friends. The process is easy and simple. Choose one of the new shoots of the bush starting out near the ground, dig a small trench in the ground and bend the shoot down into it, being careful not to separate it from the parent bush, cut into the shoot from the under side about three-fourths of an inch below each joint up to the center of the joint, being careful not to cut it entirely off. Fasten the shoot firmly into the trench with hooked sticks and cover with earth. This can be done at any time in the spring, summer or early fall. When well rooted, a separate rose bush can be cut off and dug up from each joint of the shoot.

Rose bushes should be moved or transplanted early in the spring before a new growth is started; in this way they will sometimes bloom well the same year.

The ancient poets say that the first rose was brought into the world by the "god of love," and the occasion was a desire to bribe Harpocrates, the god of silence, to an engagement that he would discover none of the secrets of Venus. Hence it became a custom to place a *rose* in rooms devoted to mirth and entertainment as a symbol in the presence of which all restraint might be laid aside; accordingly the proverb under the rose denote secrecy and inviolable silence. The rose is also from the same cause the direct emblem of silence. Besides the use of the rose at the feasts convivial meetings of the ancients, it was also frequently laid upon the tombs of the dead either to signify the silence of death, the nightingale in another to be chosen with, or as an offering grateful to the deceased. I quote from "Poetry of Life," published more than thirty years ago by Miss Sarah Stickney, the beautiful language that a lady only can use.

"From the majestic sunflower towering above her sisters of the garden, and faithfully turning to welcome the god of day to the little humble and well-known weed, that is said to close its crimson eye before impending showers, there is scarcely one flower which may not from its loveliness, its perfume, its natural situation or its classical association, be considered highly poetical. The 'lady rose,' as poets have designated this queen of beauty, claims the greatest consideration in speaking of the poetry of flowers. In the poetic world the first honors have been awarded to the rose, for what reason it is not easy to define, unless from its exquisite combination of perfume form, and color, which has entitled this sovereign of flowers in one country to be mated with the nightingale, in another to be chosen with the distinction of red and white as the badge of two honorable and royal houses. The common wild rose is produced without the aid or interferance of man. Blooming in the sterile waste, this lovely flower is seen unfolding its fair leaves where there is no beauty to reflect its own, and thus calling back the heart of the weary traveller to thoughts of peace and joy, reminding him that the wilderness of human life, though rugged and barren to the discontented beholder, has also its sweet flowers not the less welcome for being unlooked for, nor the less lovely for being cherished by a hand unseen."

Friends, the rose still maintains her supremacy in every part of the world. She has long been recognized as queen of all the floral kingdom, and, while we concede to all the flower producing plants the full measure of praise for their numberless beauties, peculiarities and attractions, we should accord to the rose the tribute of our highest admiration and cheerfully welcome her to our homes and surroundings. Give her the care and protection which is so essential for her success in this, our Northern clime, and she will bountifully repay us with a brilliant display of her unrivaled glories in the coming joyous summer days.

"From the weather-worn house on the brow of the hill,
We are dwelling afar, in our manhood to-day;
But we see the old roses and hollyhocks still,
As they looked when we left them to wander away.
Farewell to the friends of our bright boyhood days,
To the beautiful vales where the roses did bloom;
To the fathers, the mothers, now gone from our gaze,
From the weather worn house to their Heavenly home,
Where they wait, where they watch, and will welcome us still
As they waited and watched in the house on the hill."

Following Mr. Barter's paper, the following was read:

NOTES ON ROSES, BY THE SECRETARY.

A choice list of roses was given in Dr. Mead's paper, page 310 in our report for 1883. In my visit to Washington, in September last, I saw the Bancroft Rose Garden, and spent some hours in it with Dr. Mead, under the guidance of Peter Carroll, the gardener, and John Brady, the rosarian mentioned by Dr. Mead. Some extracts from my note-book may be of interest in this connection:

The La France, at Mr. Bancroft's garden, develops a climbing habit when grown under glass, where it does better than out of doors.

The best tea rose is the Catharine Mermet, a creamy, pinkish white. This is the great historian's favorite.

A lovely purplish rose with a fruity fragrance is the Aline Sisley.

The Adam is a delicate double flower, but a profuse bloomer; color a light pink.

The Countess de la Barthe, a creamy pink; very fine.

Madam Lambard, a deep pink.

Captain Christy resembles the Victor Verdier in growth of bush. It is a large rose, of a delicate white pink color, very rare and choice. It has a marked expression of its own among a collection of plants, from its peculiarity of blooming from the terminal bud.

The best white hybrid perpetual is the Mabel Morrison.

Mr. Brady showed me at his own place what seemed to me to be a remarkable growth from budding of the rose. This was a Devoniensis worked on a branch of the Solfaterre about four feet from the ground. The bud was inserted about the middle of August. On the 18th of September, when I saw it, the branch grown from this bud had twenty-one well developed flower buds on it and one open bloom. Ordinarily the Devoniensis is a weak grower, but on this stock it is rank and vigorous. The flower is creamy white and very large, sometimes four inches across its face, and the petals are of great substance. It is known as the Magnolia rose, from its large size and sweet heavy fragrance.

Mr. Brady has grown the Solfaterre one hundred feet long.

In the course of some manual lessons he gave me in budding the rose, I asked him what we could use to advantage for stocks in Minnesota to increase our list of garden roses by budding.

"You have the Sweet Briar in your country?"

"Yes."

"It is a free seed-bearer with you?"

"Yes."

"Grow seedlings from it. Put away the seeds in damp sand in the fall. Plant them out in the spring. When they are sufficiently grown, bud into them near the ground, as low down as you can work them. These stocks are hardy and vigorous and will not sucker from the roots."

In a note received from Mrs. Isaac Atwater, who furnished the excellent paper on roses at our winter meeting in January, 1881, her note being written in reply to an invitation to write us another paper, this lady says:

"If you have a discussion on rose culture do please insist on the absolute necessity of the close pruning of remontant roses.

Many people in Minneapolis have more or less varieties of these roses, but one scarcely ever sees a bloom on them except in the spring, making them of no more value than a June, while my remontants were always in bloom from June till October, more especially the General Jacquiminots, the result of constant and severe pruning. I was experimenting with some new remontants the season before we sold our place, and found one—Madame Marie Tuiger—a very choice acquisition, an improved (if possible) La France, and another, I am not quite sure of the name, but think it was Adele Carriere, was a lovely rose and a constant bloomer."

Refering again to Dr. Mead's contribution last year, on rose culture, I give here another letter from him on the same subject:

LETTER FROM DR. MEAD.

WASHINGTON, D. C., Jan. 3, 1884.

Secretary Gibbs:

In reply to yours requesting some further notes on rose culture I have only to say that the last year was not a good rose year for this part of the country, and we were obliged to put up with many disappointments. I have no reason to lower my praise of any that I mentioned before; but believe that if we would grow our teas under glass we would get much more satisfactory results than growing them in the open border,—still as but few of the real lovers of the rose are able to grow them in this way, the greatest benefit will be done by a systematic study for the purpose of ascertaining which roses will prove the best for out-door culture in different sections of the country. Here we get very good results with the Marshal Niel grown out of doors with protection in the winter. As the thermometer seldom gets below zero here, very little protection is required, the main point being to keep it from freezing and thawing, as it is this process that kills plant and tree life more than the simple freezing. Solfaterre, another choice Noisette, does well in the open border with slight protection. Of course neither of these would live through your hard winters thus treated, and occasionally they are greatly injured here. Of the teas very few need any protection. Last winter I covered my Perle des Jardins and Jean Pernet with a few others, but do not think they were very much benefitted thereby. For this winter I simply bent the tall growers to the ground and shall let them so remain till spring, except with Marshal Niel. As the teas are such lovely roses, so sweet, beautiful and prolific, I think you could well afford to cultivate them even though you should have to raise them in the fall and place them in your cellars during the winters. By this process you would lose some, but after a few years thus treating them, you would learn their habits and requirements so that the loss would be reduced to a minimum. The secret would be to let the wood get well ripened before lifting, and then placing them in a light room (cellar) with sufficient moisture to keep the roots from becoming dry. They should not be planted out before all danger of severe frost is over and then pretty well cut back. I believe that in this way you could raise teas in your gardens and have as good specimens as we can here. As your season for blooming is shorter than ours, very likely you would average better blooms than we get. The hardy hybrids might be bent close to the ground, well hilled up about the roots and then all covered by straw in such a way that the water would run off, or away from the bush; and I think you would have little loss by this means. The greatest danger in this would be from too early uncovering. This should not be done until the weather has become warm and all the frost is out of the ground. Neither should they be raised from the ground as soon as uncovered. These are the opinions that I have arrived at in my experience; however, you may find them impracticable in your state.

I have received your circular containing programme, &c., of your next meeting. I would like very much to be with you, for I have come to the conclusion from reading the volume containing the minutes, &c., of your last meeting, that yours is a live society, and that you are after *facts* first and theory afterward. Still a man without a theory will not make much of an investigator.

I see that Ellwanger & Barry, of Rochester, have succeeded in raising two new roses, one a hybrid, raised from the seed of General Jacqueminot and named Marshall P. Wilder. It is described as an improved Alfred Colomb, and they (E. & B.) believe it to be the best American Rose yet raised. I have great confidence in the opinions of these gentlemen, and do not believe they would wittingly misrepresent any rose, or in fact anything. And as they have had it on trial for several years, I have no doubt this will prove all they say about it. The other is a miniature rose of slender growth and raised from the seed of the Marie Van Houtte, and called Rosalie, or Fairy Queen. I have seen neither of these and therefore say nothing of them from my own personal experience, but as they are recommended by E. & B. I have no doubt of their excellence.

I see by your programme that you will have two papers on subjects especially interesting to me, and shall wait perhaps impatiently for your report to read them. I refer to the one on "Wild Flowers of Lake Pepin Valley" and the one on "Roses for the Northwest." I hope neither will prove only for the ear, and then to be forgotten.

THEO. MEAD.

MINNESOTA SEEDLING APPLES.

A letter was read from J. M. Thresher, of Fillmore county, answering inquiries of the Secretary in regard to the Rollins apples. He says the Rollins Russet and Rollins Prolific seem to stand well, but himself and neighbors have not had good success with the Rollins Pippin.

TIDINGS FROM CALIFORNIA.

An interesting letter was read from Wyman Elliott written at Santa Monica, California, in which he described the horticulture of California as he found it.

THE FORESTRY ASSOCIATION.

The Secretary stated that from present appearances there was not likely to be much of an attendance from the Forestry Association at the proposed joint meeting to-morrow, and recommended that we proceed with our regular program, and take up Forestry when we reach it in the course of business. This was agreed to.

THE GOVERNOR'S VISIT.

The Secretary also stated that it had been the desire and expectation of Governor Hubbard to be present at one session of our Society this week, and at the joint meeting on forestry, but the fire at Stillwater had thrown a mass of business suddenly upon the Governor, and he was much pressed for time ; was even now necessarily away on a trip to Chicago, and it was not likely he would return soon enough to make us his contemplated visit.

AWARD OF PREMIUMS.

The award of premiums was then read, as follows :

APPLES.

	Premium.	Am't.
Display Wealthy, Charles Gould	1st	$4 00
Display Wealthy, Andrew Peterson	2d	3 00
Display Wealthy, P. M. Gideon	3d	2 00
Plate Wealthy, Underwood & Emery	1st	2 00
Plate Wealthy, Charles Gould	2d	1 00
Plate Wallbridge, E. Wilcox	1st	2 00
Plate Wallbridge, O. Gibbs	2d	1 00

Plate Utter, O. Gibbs	1st	$2 00
Plate Talman Sweet, George J. Kellogg	1st	2 00
Plate Talman Sweet, J. S. Harris	2d	1 00
Plate Wolf River, S. Barter	1st	2 00
Plate Northwestern Greening, E. W. Daniels	1st	2 00
Plate Pewaukee, George P. Peffer	1st	2 00
Plate Krause Seedling, Andrew Krause	1st	2 00
Plate Orange, Underwood & Emery	1st	2 00
Plate Minnesota, Underwood & Emery	1st	2 00
Plate Minnesota, L. E. Day	2d	1 00
Plate Scott's Winter, Underwood & Emery	1st	2 00
Plate Red Anis, Underwood & Emery	1st	2 00
Plate Crab Seedling, S. Bates	1st	2 00
Plate Roman Stem, S. Bates	1st	2 00
Plate New Codling, S. Bates	1st	2 00
Plate Forster's Sweet, William Forster	1st	2 00
Plate Seeknofurther, S. Bates	1st	2 00
Plate 240, Lieby, Plate 378, Hibernal, Plate 410, Little Seedling, Plate 272, Ostrekoff Gloss, A. Peterson	Special	8 00
Plate Asfeld Seedling, Charles Ludluff	1st	2 00
Plate Robinson Seedling, Charles Ludluff	1st	2 00
Plate Seedling (4 entries), J. C. Kramer	1st	8 00
Plate Seedling, Phil Everhard	1st	2 00
Plate Seedling, Joseph Wright	1st	2 00
Plate Seedling, Joseph Wright	1st	2 00
Plate Waupaca Seedling, W. A. Springer	Special	2 00
Plate Fameuse, L. E. Day	1st	2 00
Plate Fameuse, E. Wilcox	2d	1 00
Plate La Crescent, E. Wilcox	2d	1 00
Plate A. S. Winter, L. E. Day	1st	2 00

VEGETABLES.

Winter squash, J. T. Grimes	1st	75
Winter squash, J. T. Grimes	2d	50
Half peck early potatoes, K. H. Whipple	1st	2 00
Half peck winter and spring potatoes, O. Gibbs	1st	2 00
Half peck winter and spring potatoes, J. T. Grimes	2d	1 00
Half peck table carrots, K. Whipple	1st	75

PANTRY STORES.

Display canned fruits, W. Golden	1st	3 00
Display canned fruits, J. F. Hosmer	2d	2 00
Sample of home-made vinegar W. Golden	1st	1 00
Sample home-made vinegar, K. H. Whipple	2d	50
Sample strained honey, L. E. Day	1st	1 00
Sample strained honey, Charles Ludluff	2d	50
Sample preserved rhubarb, E. H. Cuzner	1st	1 00

WORKS OF ART.

Collection of paintings of Minnesota fruits and flowers, Mrs. West	1st	$5 00
Single fruit painting, Mrs. H. B. Sargeant	1st	3 00
Single fruit painting, Mrs. W. W. Folwell	2d	2 00

SEEDS.

Collection of Minnesota-grown garden seeds, E. Webster	1st	6 00

Following the awards of premiums, the committee submitted the following special report:

REPORT OF COMMITTEE ON EXHIBITS.

Your committee on exhibits and awards at this meeting would submit the following:

1st. We find about fifty varieties of home grown apples and Siberians on exhibition, which in point of all the essential qualities of size, beauty and flavor, are of superior excellence, and would do honor to the winter exhibit of any Western States, and are very encouraging to the Pomologists of this State.

2d. We find worthy of special mention, the exhibits of new varieties, seedlings of this and other states, with some of the new Russians, of great beauty and excellence, among which we notice the collections of Andrew Peterson, of Wauconia, and Charles Ludluff, of Carver, which are a lesson worthy of careful study by our members. We also would mention the show of Wolf River and Northwestern Greening, from Wisconsin, which promise especial merit to this State. Also the spicy seedling of William Forster, of Chatfield.

3d. We also would give special mention of the wondrous imitations of nature in the fruit and flower pieces on exhibition from our home artists, Mrs. West, Mrs. Sargent and Mrs. Folwell, which are " true to life," and worthy of a place in every collection of home decorations, and especially worthy for the educational effect upon the people.

J. C. PLUMB,
F. G. GOULD,
E. D. PORTER,
Committee.

Messrs. Plumb and Gould of the above committee, also reported complimenting the handsome exhibit of forty varieties of potatoes grown at the State University farm, under the charge of Prof. Porter.

MORNING SESSION.

Fourth Day, Friday, January 18th, 1884.

THE SUMMER MEETING.

At the opening of the session to-day, Truman M. Smith, of St. Paul, the newly elected President, took the chair. Prof. Porter introduced the subject of the Summer Meeting, and hoped we would have a program of more general interest than we had last year. He thought we might vary the usual exercises by visiting the market gardens and fruit farms of both Hennepin and Ramsey counties. "For myself," said he, "I would rather spend one hour on the grounds of a practical horticulturist than to hear him talk ten days."

THE NEW UNIVERSITY FARM.

"And while I have the floor," Prof. Porter continued, "I will invite your attention for a few moments to the New University farm. The objects of the farm are three-fold:

1st. To illustrate the class work of the lecture rooms; 2d. to make experiments in the practice of agriculture in all its departments; 3d. to carry on original investigations and establish correct principles. We have the best location in the State of Minnesota for such a farm and experiment station. It is midway between the two great cities of the State; it has every variety of soil and exposure; is abundantly equipped in every way, and has the full and cordial support of the Board of Regents. The farm is new, as you are aware, having been purchased but a year ago, when the old farm was sold. The past year we have been occupied in the erection of buildings, and getting the farm in order. We hope to have things in shape by the time of your summer meeting, to show at least a commencement of our work. I hope you will not forget that by the acceptance of the invitation given you last summer, the members of the Horticultural Society are to be our guests at the farm at the time of your next Strawberry meeting. We shall then, as now, and at all times be glad to receive any advice or suggestions you or any one may have to offer for the management of the farm, or in reference to any experiments you desire to have made in agriculture or horticulture, and especially we solicit seeds, cuttings, plants, trees, etc., for trial. We will propagate every thing in this line found worthy, and distribute for the best interests of the people of this State."

Prof. Porter offered samples of the new varieties of potatoes on exhibition to any who might want them for trial.

Mr. Harris. I commend most heartily this farm and the suggestions of Prof. Porter to the members of this Society. As horticulturists we can help the State University and Prof. Porter in carrying out their plans in regard to it, and on the other hand we can look to it for systematic work and careful records in all the experiments in which we are interested. The farm consists of 260 acres. It has cost from $200 to $300 per acre, but by the rise in the value of lands is now worth $500 per acre exclusive of improvements. The farm in many respects is one of the best anywhere; and when its buildings and equipments are completed, it will be the best of its class in the country.

Secretary Gibbs. I have always thought well of these experimental farms, but have never so fully realized their importance and usefulness to the public as I have since visiting the New York experiment station at Geneva on my return from Philadelphia last fall. Dr. E. Lewis Sturtevant, the director, gave me half a day of his time in showing me around the farm and explaining the experiments that were being carried on; and I came away fully convinced that if our farmers would visit these experimental farms and agricultural colleges, and get really acquainted with their purposes and their practical workings, it would not be long before their boys would be flocking there for a better education in farming, as they do now to the classical colleges to learn to be doctors and lawyers.

The State Horticultural Society will expect great things from this University farm in its departments of pomology and gardening, and it is safe to say that our members will always be found its cordial co-workers and supporters in every step to advance the standard in these departments. I only hope the other branches of agriculture will organize as efficiently and co-operate with the management of the the farm as thoroughly as we will.

HALL FOR FUTURE MEETINGS.

Prof. Porter. I wish to say a word further in regard to the home of this society here at the Agricultural College. The Board of Regents takes note of your largely increasing numbers, and of the necessity for providing a hall large enough to accommodate not only this society, but all other assemblies or societies that come here in the interest of agriculture; and it is hoped that before your annual meeting occurs here again they may be able to offer you a hall that will accommodate any audience you can bring. The appropriations have been made for all necessary buildings in addition to what we have, but we have been and still are delayed in getting the money by the burning of the State buildings, and the extraordinary drafts for funds to rebuild them.

A. W. Sias here presented to Prof. Porter the relics of the Rochester tornado, and Mr. Harris the specimens of Minnesota woods on exhibition, for the benefit of the Agricultural College Museum.

The Secretary reported progress for himself and Prof. Porter as a committe to select a device for a seal. Nothing had been evolved that was quite good enough to express our high aims, ambitions and hopes; the best they had to offer was the figure of a young girl on tiptoe under an apple tree, one hand bending down a branch, and the other grasping an apple. If this were engraved with a motto, "Reaching for Fruit," in good Latin, it would at at least be expressive. The picture was handed around for inspection, and taken under advisement for another year. Meantime *sealed* proposals for furnishing a better device are solicited.

THE RUSSIAN MULBERRY AGAIN.

A resolution having been offered by R. Porter declaring the cultivation of the Russian mulberry to be a humbug, Col. Stevens said there was no doubt about its hardiness. To be sure it would kill down some when young, but would grow up again and soon get over that. He put out one hundred of them five years ago, and they were all living. The Mennonites who brought them to Minnesota grow them largely at Mountain Lake. He had been there to see the trees and found the tallest one thirty feet high. They make good hedges, and the fruit is desirable. Would not reccommend it for a shade or ornamental tree.

Mr. Emery drew a diagram on the blackboard and explained the manner of growth of the mulberry. It is close-jointed, hardy, an excellent wind-break and the natural food of the silk worm. It can be grown from cuttings, but not successfully except with the best of facilities and expert care. We advise the ordinary planter to get roots every time. The silk work industry promises a new and paying employment, especially for women, and we want the mulberry. Keep it, encourge its planting, and it will bring us good returns for our care and money.

Mr. Whipple thought it could be successfully grown from cuttings. From one hundred cuttings he had raised twenty-seven healthy trees.

Mr. Sias concurred in this opinion.

Mr. Fuller had made a failure of it with both roots and cuttings. The trees had killed to the ground in winter.

Prof. Porter thought the Russian mulberry contained germs of inestimable value here. Besides its use as the food of the silkworm, it was excellent for an ornamental hedge. Of 1,000 miserably cared-for cuttings he raised on the old experimental farm 200 trees. The trees winter killed about half way down, and grew up again the next year. On the State fruit farm he had seen as fine a hedge of mulberries as he ever noticed in Southern Ohio from the Osage Orange. He thought we must begin with seedlings, as in other fruits; it would take time, but the promised results would justify the experiments. He urged the importance of its culture as the beginning of a new industry—silk culture; as a means of raising a valuable fruit; as a windbreak or hedge, and, finally, because it could be readily grown.

Mr. Emery supported the suggestion of Prof. Porter that we grow the mulberry from seed. This was the line of work for improvements in all our trees and fruits.

Mr. Bussee had grown them for two years. They started late in the spring, but had only winter killed down four or five inches.

Mr. Gideon. We have at our place at Excelsior two rows of the mulberry that make as solid and compact a hedge as the Osage Orange. It will feed two crops of silk worms. The fruit will be worth something by and by. We must improve it by seedling production. Our only hope is in seedlings—seedling mulberries as well as seedling apples. Must reject the poor, select the best; let the fittest survive. It can be developed, and is worthy of continued trial.

Mr. Emery. From seed it can be grown eighteen inches the first year.

Col. Stevens. Yes, six feet.

RASPBERRIES.

What is the best raspberry for general cultivation?

Mr. Golden. For a late variety, the Superb; for medium, the Philadelphia. Turner is good.

R. Porter. The Philadelphia for money.

Mr. Whipple. Have had eight crops of Philadelphia and no failures. The first year I hoe the ground clean; the second year mulch heavily with bagasse, and no cultivation is needed.

Mr. Sias preferred the Turner. It propagates rapidly and is hardy.

Mr. Harris. The old purple cane is a good berry for farmers. It is hardy and productive; but too small and soft for market. Would recommend the Cuthbert for its excellent quality.

Mr. Gould. I like the Philadelphia best for market and the Turner for my own use. My Philadelphias gave three quarts to the hill. The Turner covers up its fruit with the foliage.

Mr. Emery. The Cuthbert is the best late variety. The Philadelphia is the fruit for farmers.

C. L. Smith. But not so good for the gardener, as it does not carry well. Cuthbert will still look best after keeping two or three days, and as a shipping berry it is superior. The Turner was a long continuous bearer. They will sometimes last for six weeks. Yet there was more money to the acre in the Philadelphia for home market than in any other. He would recommend to plant all three of these sorts for home market. He argued the importance of better culture of the raspberry, and heavy mulching with straw or bagasse if you have it.

Mr: Pearce. I looked over all the varieties three years ago, and Prof. Porter told me to see to the Cuthbert. I did so, and have not regretted it. Have seen berries on it in September.

BLACKBERRIES.

In a discussion on blackberries, Mr. Bussee related his experience and failure with Ancient Briton, which Mr. Pearce pronounced worthless for general cultivation.

Mr. Emery. Stone's Hardy has a low growing habit and is easily covered up. It needs no protection except in the severest winters.

GENERAL BUSINESS.

C. L. Smith was by resolution invited to prepare a paper for the next annual meeting on small fruit culture and roses.

Mr. Emery tendered his services to any local horticultural society, free of expense, to attend its meetings and impart instruction on any branch of fruit culture.

The sum of sixty dollars was voted to the Secretary for assistance in preparing the Annual Report for press, and in proof reading, to include the reporter's services at this meeting.

D. W. Humphrey, of Faribault, and M. Pearce, of Minneapolis, were made honorary life members, and Mrs. West, of Minneapolis, an honorary member for the year 1884.

FRUIT LISTS.

J. M. Underwood, A. W. Sias, and Wyman Elliot were appointed a committee to revise the fruit report for next annual meeting.

FINAL RESOLUTIONS.

The committee on Final Resolutions made the following report:

Mr. President and Fellow Members:

Your committee on Final Resolutions recommend the following:

Resolved, That the thanks of the Minnesota Horticultural Society are due to the Chicago, Milwaukee and St. Paul, the Chicago and Northwestern, the Minneapolis and St. Louis, and the St. Paul and Duluth Railroads, for rebates from regular passenger fare; to the daily newspapers for full and copious reports; to the students of the University for the sweet music rendered at our sessions; to the State University so ably represented in our meetings by the presence of Professors Folwell, Porter, Hall, and Winchell, for the accommodation of an audience room, and to the citizens of Minneapolis, who have so nobly responded to the call of our able committee on entertainment, in affording the members of the convention homes during their stay in the city; and in leaving Minneapolis, we carry with us to our homes lively recollections of generous treatment at their hands, and our best wishes for their continued health and prosperity.

S. M. EMERY,
JOHN. S. HARRIS,
G. W. FULLER,
Committee.

The report was unanimously adopted by a rising vote, and the Minneapolis and St. Paul papers requested to publish the resolutions.

Secretary Gibbs. Referring to that part of the Secretary's report, relative to courtesies extended by this society to the American Forestry Congress, I offer the following resolution:

Resolved, That the thanks of this society be tendered to the ladies of the Jewell Nursery for the magnificent collection of flowers presented by them to the American Forestry congress, in August last, with the compliments of the Minnesota Horticultural Society.

Resolution adopted unanimously.

AFTERNOON SESSION.

FORESTRY DAY.

Fourth Day, Friday, January 18th.

The subject of Forestry being first in order, the following resolutions were presented by the Secretary, and unanimously adopted without discussion.

THE TIMBER CULTURE ACT.

Resolved, by the Minnesota State Horticultural Society that the senators and representatives in congress from this State be requested to use their influence to prevent the repeal of the timber culture act, and to secure the passage of such amendments as will prevent abuses and promote its efficiency.

Resolved, That the thanks of the society be tendered to Hon. H. B. Strait, for his prompt action in this direction.

The following papers on forestry were accepted without reading, (the authors not being present), and were ordered printed.

THE TIMBER CULTURE ACT; SHOULD IT BE REPEALED?

By Franklin B. Hough, Lowville, N. Y.

In considering this qestion, it will be proper to take notice of the origin and intentions of the law, the manner in which it has been executed or evaded, and the points of excellence or of fault that it involves. From these data we may reasonably arrive at some conclusions as to its continuance, with or without amendments, or its entire repeal.

It is a matter of record, that the act under notice was introduced in Congress by the Hon. Mark H. Dunnell, of Minnesota, to whom also we are indebted for the laws under which investigations in forestry were first commenced in 1876.

It was the beginning of the conservative measures for the maintenance of our forests, the need of which must have convinced every thoughtful person who has noticed the rapid exhaustion of these resources, and the entire neglect of measures for their renewal. This waste and neglect, tend inevitably to want, and as this want approaches, the gradual advance in prices, gives unmistakable notice of its coming.

In its original form, as enacted March 3, 1873, this act offered 160 acres of land to any person who should plant 40 acres, and keep the plantation in healthy condition for ten years, the trees being not more than 12 feet apart each way. If the person failed to keep his plantation in good condition, or if he failed to cultivate and protect it, the land reverted to the government, subject to a new entry, and the investment was lost. There was a provision in favor of the homestead settler, and the entry was not to be liable for the previous debts of the planter. There was no requirement as to residence, nor was there any means provided for ascertaining a failure, during the ten years of probation, unless upon complaint of some contesting applicant.

In every untried experiment, difficulties are liable to arise which could not be foreseen, and a short experience brought to notice certain defects, which led to an amended act one year afterwards, the points of amendment being as follows:

The person making the entry, must be at least twenty one years of age, and a citizen of the United States, or if not, one who has declared his intention of becoming one. The time of proving up was reduced from ten to eight years. An amount less than a quarter section, if eighty or forty acres, might be entered, the requirement for planting being a fourth part of the land entered. No person could make more than one entry, unless fractional subdivisions were entered amounting in all to a quarter section.

It was now required that the land should be broken before planting, one-quarter of the land intended for woodland being broken the first year, another quarter the second year, and the remaining half the third year. One year after breaking the land was to be planted as before, and after that nothing more was specified as a requirement, beyond protection, until the time of proving, eight years after entry.

In case of death, an heir might succeed to the benefits of the whole, or a part, accordingly as they were found entitled.

The principal fault in both of these acts, was in allowing the trees to be set too widely apart. The rule might work in a climate like that of New England, where almost any kind of a tree set in such soil as we find on the prairies, would grow to meet its neighbor half way, if the distance was twelve feet or even more; but upon the western plains and prairies, although the soil may be fertile, the air is dry. The climate is subject to greater vicissitudes, and with the drying winds and the droughts that are very liable to occur, the young tree, if set with roots, and with the very best of care and cultivation, has little chance of growing to much height, if at liberty to spread low, and with some species it would be doubtful if it grew at all.

This defect in the law was remedied by a third law, passed June 14, 1878, which is with slight amendment still in force. It reduced the interval between the trees to four feet, and the area to be planted from one-fourth to one-sixteenth of the whole amount entered. If the entry be a full quarter-section, five acres must be plowed the first year, and five acres the second. In the second year the first five acres must be cultivated with a crop or otherwise. In the third year, the first five acres must be planted with trees, tree-seeds or cuttings, and the second five acres must be cultivated. In the fourth year, the land last broken must be planted, and after this the whole must be protected until the time of proving for title, eight years after entry.

Such is in substance the law in its present form, the merits or defects of which we are now to consider. It may be said in general, that if faithfully and conscientiously done, according to the requirements of the law, and with the careful cultivation after planting which every owner should give his land, to secure the very best result, we might reasonably expect to see a thrifty young grove at the end of the eight years, whenever trees can be cultivated without irrigation in any part of the country.

But it is a well known fact, that this careful attention cannot always be given. In many cases the planter has not the experience needed for successful management; or he is liable to commit errors, by depending upon an experience gained under widely different conditions and which must fail him altogether in his new enterprise. Between this neglect of some, the mistakes of others, we would naturally expect to find many tree-claims below the standard of excellence due to good management, at the time of claiming title, and some that should be rejected as failures.

I consider the present law chiefly defective in its failing to require, *that land once entered for tree-culture should thereafter be subject to no other form of entry.* It has been a practice very prevalent in some land districts, for persons to enter timber-culture claims who did not intend to plant a tree. If located in a region that was filling up with settlers, they might reasonably expect, before the time for planting, to find some person who would be willing to pay them one, two or three hundred dollars to abandon the claim, when the purchaser would stand ready to enter it as a homestead, or to purchase it at the government price.

This custom has been practiced upon thousands of occasions, and the country has lost the benefits that should have resulted from the plantations. In other instances entries have been made, to acquire temporary possession for pasturage, or in anticipation of the location of a line of railroad, or of a town site. The adventurer in these cases, only risked his chances for a year or two by the payment of the office fees, and might strike a success. If he failed to sell, only these fees would be lost, and he might go elsewhere and do likewise.

Of course, no law could be framed, that would compel a man to do what he was not able to accomplish, nor would it be just to deny him the privilege of selling his improvement, and his opportunity to enter another, or to deny the purchaser the benefits of his purchase. But it is certainly quite within the power of congress, and I regard it as their duty, to enact, that land once entered for timber culture, shall be held thereafter by no other title;—and furthermore to enact, that this proportion of woodland shall be maintained upon the land there ever after, as a condition of the title. It need not be the identical area first planted, but I would have at least one sixteenth part of the quarter-section always after in woodland, under penalty of forfeiture of the title. Should such requirement ever be enacted, it should of course provide for unavoidable losses, as in case of fires, where a reasonable time should be allowed for re-planting, and for exceptional cases, where it might be inexpedient or improper to insist upon the maintenance, as where a village or a town might spring up upon the land.

I regard the present law as also defective, in its not providing any certain means for ascertaining at the several land offices, and through these at the general land office, the facts as they are, concerning the execution of the law, from year to year. It would be no hardship for the holders of these claims to be required to report annually to the register of his land district, the amount of land broken and cultivated, and planted with trees, at the end of each year. The blanks for this purpose might be issued with the certificate of first entry, or might be sent through the mails as they were needed for use. They should be properly certified, and false reports might be punished by forfeiture of title. With such reports properly consolidated, we would be able to know definitely, what we can now only guess at, as to whether the timber culture act is destined to be as successful as its friends desire, or whether in certain regions, it has afforded only an opportunity for speculation and fraud.

Firmly believing as I do, that the agricultural welfare of the whole country would be increased and sustained, if a portion of the area was somewhat evenly interspersed with groves and belts of trees, and kept in due proportion to the cultivated surface, I would deem it proper to enact a law in the future conveyance of new lands by the government under any form of title, to insert a clause requiring that within a certain reasonable period, a given amount of land, if prairie, should be planted, or that if now woodland, that a certain portion should be reserved, and continued thereafter in some form of tree growth. Exceptions should of course be made to this rule in regions where it would be impracticable, and some might regard such a law as arbitrary and oppressive.

It may not be possible to secure such an enactment, but it is within the power of every owner of land to prove upon his own premises, the benefits of such plantations, and it is to be earnestly hoped that examples will multiply until these benefits are widely enjoyed.

THE STUDY OF FORESTRY AS AN IMPORTANT CONTRIBUTOR TO PRACTICAL EDUCATION.

[Read at the St. Paul meeting of the American Forestry Congress, August 8, 1883, and copy kindly furnished by the author.]

BY HON. H. G. JOLY, OF QUEBEC, CANADA.

There is a danger, in treating this subject, that of exaggeration which will damage the best cause.

The fact that we have met here from such widely distant sections of North America, that many of us, leaving our homes and occupations, have traveled hundreds and hundreds of miles, to attend this Forestry Congress, is a strong guarantee that every effort made to raise in public estimation, the study and practice of Forestry, will meet with your hearty support; but I wish to appeal to your reason, rather than to your sympathy, and to satisfy the judgment of the thoughtful men who are ready and willing to join every earnest effort if they can once see that its results will be beneficial to mankind.

What is meant by *practical education?* Training the child, his body, his mind and his heart for the work of life. It is a general preparation for it. When you begin the education of the child, you do not know what his future occupation in life will be. A good education is like a solid foundation, built on the rock, ready to receive and support, with safety, any kind of superstructure that may be erected upon it.

Education is Training. There is mental gymnastic to train the mind, as well as corporal gymnastic to train the body. A man is not often called upon in after life, to repeat the performances learnt, as a boy, at the gymnasium; he may even forget them, for want of practice, but he will preserve through life some of the strength and activity thereby acquired.

The aim of practical education or training ought to be as much as possible, to choose for the training of children such exercises as will be directly applicable and useful in after life, and I think the study of forestry fulfills these conditions, to a great degree.

Timber is in request more or less, all over the world. The Esquimaux is about the only man who dispenses with it, not from choice, but because he cannot get it; his winter residence is built with blocks of ice, and he braves the angry waves of the North Seas in a leather canoe ribbed with the bones of whales. Everywhere else you will find wood, sometimes only the palm tree, or even the bamboo, but everywhere, in the wildest as in the most civilized countries, you will find wood in daily use.

Where the natural growth of timber is abundant, the people will waste it if they are not brought up with a due consideration of its value. As a Canadian I can speak with some experience on that point. In such countries, people ought to be taught the value of timber, which trees to cut, which to preserve, how to thin their forests with judgment, so as to increase their value, while deriving a good revenue from them.

On the other side where the timber is scarce or where there is none, like in the western pariries, people must be taught how to grow it. They must learn what kinds of trees are best adapted to their soil, their climate and their wants, and how to grow them.

It is wonderful how little the country people in general, know about forest trees. Let them begin to learn when they are young, the best mode of instructing the children; this is the surest way of reaching the people at large.

You will say: "You are speaking of a general system of education; remember that what you propose will only apply to the country, and not to the cities." By far the great majority of the human race live in the country, and those who are condemned to live in the cities, generally look forward, as a happy deliverance and reward for their labors, to the time when they will leave town and live in the country. Take the most devoted townsman and ask him if the forest trees are not the finest ornament of his streets. But let that distinction stand as between country people and city people, if you like. I will now attempt to show that the proposition enunciated in the title of this paper applies to both cases, and that the study of the elements of forestry can be made an important contributor to practical education.

How can you teach a child a better lesson of foresight, observation, patience, care for the smallest details and perseverance, than in teaching him to plant a tree. He will soon learn that he can only transplant his tree, with hope of success, in certain seasons; that if he does not take it up with care, carry it with care, replant it with care, it will not grow. He will soon find out that, by weeding and cultivating the ground carefully, staking his tree, pruning it judiciously, it will prosper.

Speak of the training of young trees? Has not that very example of the careful training of a young and tender tree, been taken, in all ages, in all countries, as the best example for the education of childhood?

There are not many schools, even in the cities, where children could not be taught to plant, every year, and attend to at least one tree, each. If there is no room on the school grounds, there is room along the streets, the roads, the squares, the uncultivated hills, stony patches, waste grounds in the neighborhood of cities, where trees would always be welcomed. The fact is, that in several schools the practice has been already introduced, in observation of *Arbor Day.*

It is good work for the *body* and the *mind,* and I do not fear to say for the *heart* too.

What a lesson you could teach a child, when he asks: "How "long will it take before that tree I am now planting is big enough "to cut down?" If you answer, "It may take twenty, thirty, "forty years, or more; that is a terrible long time to wait is it not? "You may die before your tree is big, or go so far away that you "will never see it again; but your work will not be lost, my child; "if you do not profit by it others will, and you will have done more "than many a grown up man has done—you will have left some-"thing useful behind you."

ADAPTATIONS AND METHODS OF CULTURE IN FORESTRY.

By Hon. Geo. H. Wright, of Sioux City, Iowa.

When we attempt to discuss the question of forest tree planting, whether it be on our prairies for shelter belts, for groves to shelter our homes and stock from winter storms or summer heat, or whether it be as a financial investment or to fulfill the Government timber culture law, the main question that presents itself to our mind is adaptability.

We should consider the locality where the trees are to be grown latitude and longitude, altitude and rainfall; the particular time of year when we get the greatest amount of rain, is it distributed through the year or is spring the season of the greatest amount of precipitation?—the soil and the general depth below the surface where water is found. All the above points have more or less bearing on the successful growing of forest trees.

The state of Minnesota is eminently a timber growing state. The soil is dry, yet water is found near the surface. These are two important factors in tree growing. The snows of winter act as mulch to the roots, and afford moisture for spring growth.

The varieties and species of trees that may be successfully grown in Minnesota, are almost limitless. The valuable conifers are found here in native forest; also the oak, maples, walnuts, elms, lindens, birch, cottonwood, and many varieties of the poplars, with other species more or less valuable. With these evidences before us showing what nature has done, we have the ground work and information for the acts of man.

Right here comes in the question for the settler, farmer, speculator and financier, can these or any of them grow trees without previous training in the school of forestry and horticulture?

Answer, yes.

Any man who can prepare the ground for the growing of a good crop of corn, can with equal care and labor grow trees.

Prepare the ground by thorough cultivation, for at least two years from breaking, before planting trees. First break the prairie in June, turn all the sod under; "do not cut and cover," but do the work well. In October, backset or cross the breaking three inches deeper than the original breaking. Crop with wheat, oats or flax the following year. After the crop has been removed, plow the ground at least seven inches deep, harrow thoroughly and if white or black walnuts are to be planted, mark the ground as for corn, four feet each way, and plant them in the fall, planting the nut with the shuck on, in the corners where the lines cross. Step on the nut after it is dropped in place. After all the planting has been done, harrow and roll the entire field.

If young conifers, larch or deciduous trees are to be planted, defer your marking until the following spring, when the ground should be marked as above described, and if to be planted in conifers, secure nursery grown, once transplanted, three year old trees, but if deciduous trees are to be planted, get strickly first-class one year old trees, and plant where the lines cross.

I have found after twenty years' experience that the best and cheapest way to plant is with a nursery spade. Place the spade point in the corner where the lines cross, hold the handle perpendicular, place the foot on the spade, pressing it into the ground the full length, then shove the top of the handle from you and at the same time turning the spade so as to open the hole as much as possible; here have the second man with the trees ready to place one tree in the hole the proper depth; hold onto it and press the earth firmly against and around the tree.

At this particular place allow me to call the attention of the planter to the importance of pressing the soil solid around the trees, so that it will exclude all openings about the roots.

Two good laborers can easily plant from two to three acres per day. In the handling of the trees from the time they are taken from the nursery where the seeds were grown to the place where permanently planted, great care should be exercised in preventing the roots of the trees from exposure to sun and wind. Remember that the roots grow in the ground and not in the air; this caution has so often been repeated, that it is an old story to the practical horticulturist, but we must remember that our vast prairies are being settled by a class of young eastern men, who have not had this matter impressed on their minds.

The question of what shall we plant must be determined by the planter himself—what are your circumstances financial and otherwise, are you a new farmer opening up a farm on the open prairie, and want shelter-belts, fuel and shade; then plant cotton-wood, white poplar, and box elder. These trees will make wood rapidly and will grow readily in comparatively new soil. If in an older country, on farms in Minnesota, pines will be valuable. For black-walnut, a deep rich alluvial soil will pay thirty per cent. on the investment in ten to twenty years. Plant our western white ash on any dry, rich prairie soil in Minnesota and east half of Dakota. Europeon larch if properly handled will give rich returns for the investment if planted in Minnesota or the Red River Valley of the north, in Dakota.

The box elder (ash leaf maple) will flourish in a drier climate that any other American tree.

The white or English gray willow when grown as a tree is valuable as a timber tree for building purposes, and when seasoned, will stand for years as a fence post.

Few persons are aware of the value of box elder for fence posts. Cut in winter, pile up clear of ground and season for eighteen months, and then set in the ground. As a fence post they will last equal to western oak.

I advise planting all forest trees on the prairie about four feet apart each way. This to many may seem too close, but my experience justifies the statement. Close planting will make long bodied trees. Grow this way from seven to ten years; at the expiration of this time the planter can commence to cut out fence posts, poles, &c. The cost of growing ten acres of forest trees on the prairie, by a farmer residing on his land, will vary from ten to fifteen dollars per acre, for a period of five years. After that date there is no expense except keeping out fires. And the value of 2000 to 2500 trees per acre. ten years of age, in a prairie country, depending on the varieties and species grown, will be from twenty-five to seventy-five dollars per acre, and an additional value of comfort and appearance that cannot be computed.

SIOUX CITY, IOWA, Jan 7th, 1884.

TREES FOR THE HIGHWAY.

LETTER FROM DR. HOUGH.

LOWVILLE, N. Y., January 5th, 1884.

Oliver Gibbs, Jr.,
DEAR SIR: —

* * * * * * * *

There is one thing that I will venture to urge upon the attention of the meeting, and through the combined influence of the Horticultural and Forestry Associations, there would be reason to hope that proper legislation might be secured. Although a year must elapse before another session, there is all the more time allowed for ample preparation.

I refer to a law *requiring* the local authorities having charge of the public highways, to cause plantations to be made along their borders. It might not at first be expedient to enforce such a law, excepting in the prairie regions of the state, but there it should not be left optional, unless a dissent were expressed by a large majority in the local elections. Upon the continent in Europe, and especially in Germany and France, where the roads are as a general rule without fences, they are seldom without their avenues of trees. The sameness in kind, and uniformity in spacing, indicates that they owe their existence to no caprice of their owners, but to the supervision of some authority of law, that directed their planting, and that protects them from harm. In Germany, these trees are often apple trees, and their fruit which is sold annually at auction upon the trees, goes toward paying for the expenses of these highways. In northern Italy such plantations are often of the mulberry, and the foliage is fed to silk worms. In some districts the tops on the side branches are allowed to be taken off for fuel, and in all of them the old and decaying trees are taken out before they have ceased to be of value for the wood, and their places are supplied by other trees.

I need not urge the importance of plantations of this kind in a treeless region like the western part of your state. Aside from the protection which they would afford as wind-breaks, they would serve to mark the route of the road, when the country is covered with deep snows in winter, or to those obliged to travel by night at any season of the year. They would encourage the increase of insectivorous birds, by affording them shelter, and above all they would impart an amenity and beauty to the country that could not fail to render it more agreeable for residence. To those who can hear no other word, it may be said, that it would make their farms worth more *money.*

In suggesting this legislation, it need not be assumed that it will prove burdensome. The planting might be limited to a certain number every year, so that the work would extend, say through ten or a dozen years. It would be just to charge the expenses upon the property of the towns, in the same manner as highway taxes, and those owning land along a highway should be allowed to do their own planting, subject to such general rules as might be prescribed by law, and to the acceptance of the authorities having the highways in charge. If these owners failed to plant, the work should be done at their expense. There will always be some, who having no land along a highway, would be required to pay their tree-tax in money, and thus the means would be at hand for paying the expenses, and the money raised would all be expended near home.

Such plantations would be failures, without adequate means for their protection from the injury that might happen from cattle, or from fires and casualties, and proper penalties should be enacted against wilful injury, or improper neglect.

In cities and villages, it is now an accepted rule, that all the trees upon any street should be of the same kind. There may be a diversity upon different streets, and a certain degree of grouping and combination upon public parks, cemeteries, and the like, but the effect is always heightened when the trees upon a street or avenue, are all of a kind, and as nearly as may be, all of a size. This rule would equally apply to country roads ; but from a diversity of soil and conditions, it might not always be best, and we are left to the guidance of the rule that applies everywhere, viz :—*to plant the kinds that thrive best.*

Very truly yours,
FRANKLIN B. HOUGH.

RESOLUTION ON PREMIUMS.

G. W. Fuller offered the following resolution :

Resolved, That in offering premiums for fruits no premiums be offered for any named varieties not recommended by this Society for cultivation in this state.

The Secretary. That resolution, if adopted in its present form, would destroy our exhibitions. We are raising a great many varieties of fruit in this state; many of them are promising, but are kept on the experimental list, and we are recommending only such as have been generally tried for a long term of years. Our premium lists, as at present made up, encourage growers to exhibit these experimental sorts, by giving premiums to such as are attractive and promising. We are not paying any more premiums than are necessary to bring out a fair display of what our people are doing in fruit raising.

I know that sometimes we have paid premiums on varieties not generally thought hardy in all parts of the state, but not on any but what are profitably grown in some parts of it, unless in cases where there were some special good reasons for it, or by inadvertence. There are a good many things to be considered in getting out a premium list and an exhibit of fruits, which are overlooked in such a resolution as this. I will mention a few. Last year we had no winter fruit in the state to show, that amounted to anything. Just across the state line, fairly in our fruit belt, in the orchard of A. J. Phillips of West Salem, Wisconsin, I ascertained that there was a lot of very handsome winter apples, of varieties quite interesting to this society, and just being introduced, but not fruiting as yet in Minnesota. They were on a very elevated site, and were a fine study in color and quality as illustrating the value of high lands for raising apples. I wanted an essay from Mr. Phillips. I wanted to get out his fruit for our members to look at and study. I wanted Mr. Phillips to attend the meeting; and so I sent him an invitation to write the essay, and we got up a premium list that invited his apples by their names. He came. He displayed his fruit. It was about all we had on our tables. It was a lovely exhibition, as you well remember. He gave us his experience in fruit raising in an interesting paper, and did us lots of good in the part he took in our discussions. He contributed one of the seven prize essays on orcharding; one of the best if not the best. He did not get the prize on the essay, but he carried off our premiums on apples, and he felt good. He had earned them. This is one instance. This resolution would have cut that scheme all up. Now another: Everybody who is looking for new and nice varieties wants to see the Wolf River apple, the Northwestern Greening, the McMahon White, the Russian Anis, the Antonovka, the Hibernal, the Little Seedling, the Bogdanoff, the Longfield, the Yellow Transparent, the Forster Sweet, the Forster Red Winter, the Giant Swaar, etc., etc. None of them are recommended by the Society at present. This resolution would not permit a premium to be offered for somebody to bring them out. In my searches for facts of interest, I am continually finding fruits that I want the grower to contribute for exhibition; when I can say to the grower, our commmittee may think it worthy of a premium, and if any is awarded you shall have it, I feel at liberty to ask for the fruit, and I always get it. Four-fifths of the apples on the tables here this winter I have gathered up and brought here in this way. Now here is another case. Over there on the table is a plate of grey gilliflower apples, which I have entered in the name of Geo. P. Peffer; another of Pewaukee, by the same. Both of them are there to illustrate a law of reproduction and variation from seed, the law laid down in Mr. Peffer's essays before this society, which I have explained to many, using these plates of fruit as an object lesson. I picked the fruit off the Green Bay tables, and asked Mr. Peffer to let me bring it here. You that know that the grey gilliflowers on that plate are from the very tree that Mr. Peffer raised from the seed of the isolated grey gilliflower tree described by him on page one hundred and twenty-five of our report of 1883, and you that never have seen the Pewaukee before but have heard of it, know its parentage and wish to study the lesson it imparts, surely will not begrudge Mr. Peffer his premium.

In this experimental stage of our fruit raising, when we have so much to learn, it will not do to have cast-iron rules about premiums. You must leave some discretion to the secretary and executive committee in lists and programs; then, if you appoint a competent set of judges on your exhibits, such as we always have had, there will not be much to complain of.

Mr. Pearce opposed the resolution. He thought if a man produced fine fruit he should be rewarded for it. We do not all agree as to what should be recommended. The majority vote is what recommends. It may not be right at all times. I can grow varieties that I cannot get recommended by the majority. If we say we will pay no premiums on a variety till the majority recommend it, the minority have no fair show. I say at present it is desirable to invite for exhibition all good fruit grown in the State.

Mr. Plumb. As a general rule, it is safe to leave it to your judges to decide whether a variety offered is worthy of a premium.

Col. Stevens, President Smith, Mr. Gideon and others opposed the resolution, and it was rejected.

THE McMAHON WHITE APPLE.

Mr. Plumb. I have found on your table here a fine plate of the McMahon White apple. It is a very interesting variety. Can any one present tell us how it is doing in Minnesota?

Mr. Taylor. It is a hardy, medium variety, bearing fairly and keeping all winter. We consider it peculiarly well adapted to top grafting on the Duchess.

[See close of this day's proceedings for letter from Mr. Taylor.]

DISCUSSION ON GRAPES.

Col. Stevens. Some of our members have expressed a wish that we have a discussion on grapes. I would like to hear from Mr. Norquist of Red Wing, on this subject, as he is a large grower and one of the most skillful and successful in the State.

Mr. Norquist. I have been cultivating grapes for fifteen years. Have Concord, Delaware, Worden, Janesville, and about sixteen other varieties. Janesville is the earliest. Moore's Early and Agawam are good.

President Smith. Moore's Early is a delicious grape, yields almost as well as Concord, but lacks vigor. Janesville will always ripen before the frost, but it does not sell well in market. I have raised 9000 pounds on two acres. My main reliance is on Concord and Delaware, but find the Agawam and Worden good varieties. My rows are eight by eight feet and vines trained on trellises. Grapes will not bear and ripen unless the weeds are kept down. Perfectly clean culture is what pays in grapes.

I have lost only three crops in twenty-five years—once from hail and twice from frost—not total, but partial losses. The last year was the worst. Sold $418 worth then, and lost probably $500 worth. I usually dress my grape ground twice a year with wood ashes and land plaster; once in the spring, and again just before the fruit ripens. Only the best varieties pay, and the fruit of these must be well selected and prepared for market. I sell only the best bunches; can get more for these than for the good and poor mixed. The old Oporto is the only variety that it is safe to leave on the trellises over winter. The Lady he believed would be one of the best of the white grapes. Conditions varied so much it was hard to generalize, but taking all situations and the years as they run, Concord pays as well at 10 cents a pound as Delaware at 20 cents. Have been often deceived and put to loss and trouble by having grape vines sent me that were not true to name. Latterly I am careful to buy only of parties who know what they are selling.

Mr. Gideon. On my ground the Eumelan yields twice as much as the Concord, and is the best in quality. Complaint had been made that it was subject to mildew, but have not seen much of it. Iona also does well at Minnetonka, has nice bunches, and we can ripen it. Brighton has the finest bunches, and has good bearing qualities. It is rather earlier than Eumelan. Worden yields well and is early.

Mr. Sias. In our part of the State the Eumelan fails from mildew.

Mr. Harris. It is worthless with us for the same reason. My grape crop this year sold for $300; would have been $600 but for the September frost, and $1000 but for destructive rains. Moore's Early was the first to ripen. Janesville is inferior in quality to Concord, but is two weeks earlier, and has more money in it. For profit he would name—1st. Janesville; 2d. Moore's Early; 3d. Worden; 4th. Concord.

BLACKBERRIES AGAIN.

Col. Stevens. There was once an abundance of wild blackberries in Carver county. What is the cause of their disappearance? Will Mr. Ludluff or Mr. Peterson answer?

Mr. Ludluff. We have them yet in the fence corners, inside of the fields. They are destroyed by stock on the ranges elsewhere.

Mr. Peterson. Another cause of their disappearance is the want of shelter, since the underbrush has been removed.

GRAPES RESUMED.

Mr. Bussee. I think we ought to take more time to discuss grapes and strawberries.

Mr. Plumb. Before we can decide intelligently as to what varieties of grapes to plant we must study their special adaptations. Varieties subject to mildew will only grow adjacent to bodies of water. We ought to have committees of observation on these points of adaptation. Away from bodies of water, plant Concord first, because least subject to mildew; then Worden, and next, Delaware. The cause of mildew was the shock to a tender leaf system by a warm day followed by a cold night. The Concord has a thick, leathery leaf that resists the influence of these sudden changes of temperature. Mr. Plumb was not in favor of mulching grapes. The ground must be kept hot for the best growth and ripening of the grape.

Mr. Pearce. As to the ripening, it makes a great difference how the rows are arranged. If the rows ran east and west the grape will ripen two weeks earlier than when they run north and south. He plants his vines on the south side, one foot from the trellis. This he considers best, after twenty years' experience.

President Smith got his best and earliest grapes from east and west rows.

Mr. Pearce. Charles Gibson, at Lake Minnetonka, has the finest grapes I ever saw. His vineyard is in a narrow clearing in the Minnetonka woods, on a hillside facing west. At first the ground was not rich enough. I advised him to save his forest leaves, make a compost of them and dress his vineyard. That doubled the size of his grapes, and they all ripened. He had Delawares, Concords, Ionas and Janesvilles. They were the finest I ever saw anywhere.

Gen. W. G. Le Duc. On which side of the lake is this vineyard?

Mr. Pearce. The east side sloping to the west, and the rows all east and west.

Gen. Le Duc. How wide is the lake opposite the vineyard?

Mr. Pearce. About four miles; timber land east and back of the vineyard.

Gen. Le Duc. You can feel the descent of moisture inland, four to fifteen miles, sometimes fifty.

Col. Stevens thought the influence of moisture was overrated. Where is the water in Scott county? What water is near Mr. Grimes?

Mr. Pearce. The best grapes in the state are always to be found near bodies of water, either on our lakes or rivers. You will find this true every time.

Mr. Plumb. Water does it. For every mile of difference in distance from water, you may reckon ten degrees in temperature. This has been tested and proved. Ten degrees higher in day time, ten lower at night. This makes all the difference between success and failure in many seasons. The equalization in temperature is what is needed. Deep cultivation might remedy the defect of location in part, but not fully.

Gen. Le Duc. Would any of you advise the planting of a vineyard on a steep northeast slope near a stream of water, limestone soil, previously timbered?

Mr. Golden instanced a vineyard so situated that was successful.

Mr. Gideon. The most unnatural exposure for grapes.

Mr. Harris has seen many wild grape vines on northeast slopes, but does not know that they bear.

Prof. Porter. Experience is against a northeast exposure, but if I had no other, I would plant there.

The Secretary. In connection with this discussion, I will print here the report of Mr. Ludluff.

REPORT ON GRAPES TESTED IN CARVER COUNTY.

By Charles Ludluff, of Carver, Minn.

We read in the Bible that Noah, after the flood, began to be a husbandman, and he planted a vineyard. This is supposed to have been at the foot of Mount Ararat, which travelers tell us is situated at about 40° north latitude and 62° east longitude. This ancient time, 4,000 years ago, and this locality, we take to be the origin of grape culture, and from then and there it has spread over the whole earth. We, in Minnesota, are from three to seven degrees farther north, where not every kind of grapes will grow; but as wherever the wild American apple, *Pyrus Malus Sylvestris*, is found, a better apple can be made to thrive, so in all regions where the Fox grape, *Vitus Lubrusca*, is at home, there a better product of grapes can be cultivated with success. Every climate has its kind that can be grown there, but we can only find it out by trial and observation; and as for several years I have carried on experiments to advance the culture of the grape in Minnesota, I present the State Horticultural Society my notes on different varieties, for such use as they may please to make with them, all based upon plantings and fruitings of my own:

Allen Hybrid—Has not done well here; discarded.
Atvey—Poor for us; discarded.
Agawam—Rogers' Hybrid No. 15; takes after Concord; discarded.
Aminia—Sweet; fine flavor for table and market.
Autochan—Arnold's No. 5, poor grower; discarded.
Black Hawk—Ripens with Concord; discarded.
Beauty of Minnesota—Good flavor; the best grape for Minnesota.
Blood's Black—Foxy; discarded.
Barry—Roger's Hybrid No. 43; productive, early; sweet.
Brighton—Ripens early; flesh tender, sweet, juicy, slightly aromatic, pleasant flavor.
Belvidere—Like Hartford; discarded.
Brand—Arnold's No. 8; poor grower; discarded.
Concord Chasselas—Poor grower; discarded.
Canada—Arnold's No. 16; poor here; discarded.
Catawba—Ripens too late; discarded.
Cassidy—Too late; discarded.

Challenge—Did poorly on my place; discarded.
Cambridge—Ripens a few days before Concord; hardy; better than Concord.
Concord, Muscat—Same as C. Chasselas: discarded.
Croton—Poor grower; discarded.
Canby's August—Very poor; discarded.
Clinton—Too poor in quality for me; discarded.
Concord—If the Concord was eight days earlier, then it would be one of the best for us; but in some seasons it does not get fully ripe.*
Conquerer—Does poorly here; discarded.
Cornucopia—Arnold's No. 2; worthless here; discarded.
Creveling—Ripens before Concord; juicy and sweet; last season it got the leaf blight on my place.
Cottage—Early; ripens before Concord, and is better.
Duchess—New; not tested yet; should be one of the best.
Delaware—Bunch medium, compact; pulp sweet, tender and juicy; productive and profitable.
Dracut Amber—Too foxy for my taste; discarded.
Diana—Ripens too late; discarded.
Elvira—Too late; discarded.
Essex—Mildewed; discarded.
Early Dawn—New; not tested yet.
Eva—Similar to Martha.
Early Victor—Similar to Martha; not tested yet.
Eldorado—Similar to Martha; not tested yet; called a fine grape.
Eumelan—For table grape this should be planted in every garden.
Guertner—Poor grower; discarded.
Green's No. 2.—Bunch large; tender, sweet; fine quality.
Green's No. 7—An extra early vigorous grower; comes near even with Delaware.
Humboldt.—Too late for us; discarded.
Hartford Prolific—Very early; otherwise not valuable.
Herbert—Roger's Hybrid No. 44; worthless; discarded.
Isvaella—Did poorly on my place; discarded.
Iona—Late in ripening; discarded.
Isabella—Too late; discarded.
Ive's Seedlings—Too late; discarded.
Janesville—Hardy, healthy, productive; quality like Hartford; valuable for its earliness.
Lindley—Flesh tender, sweet, aromatic; a table grape.
Lady—Early; of the best quality.
Logan—Too poor; discarded.
Mascatawny—Too late; discarded.
Massasoit—Roger's Hybrid No. 3. early; flesh tender, sweet; this is a very profitable grape.
Mary Ann—Foxy; discarded.
Martha—A little foxy; flesh tender and sweet; earlier than Concord.
Merrimac—Roger's Hybrid No. 19; good when it gets ripe; discarded.

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*NOTE BY THE SECRETARY. Mr. Ludluff's soil and location is not favorable to the early ripening of the grape, though his latitude is below 45°

Miles—Very early; flesh tender and pleasant.
Minnesota Mammoth—The name is too good for it; a poor grape; discarded.
North Carolina—Poor quality; discarded.
New Haven—A seedling from Concord; early; good quality.
Northern Muscadine—Foxy; berries drop from the bunch when ripe; discarded
Othello.—Arnold's No. 1; all of the Arnold's Hybrids are poor with me; discarded.
Pocklington.—New ; should be one of the best.
Roger's Hybrid No. 5.—One of the finest, but a little too late.
Roger's No. 33.—Berries very long ; good quality.
Roger's No. 30.—Same as No. 33.
Rebecca.—Poor here ; discarded.
Rochester.—Early, sweet ; fine flavor.
Salem, Roger's No. 53.—Poor on my place, discarded.
Senesqua.—Too late; discarded.
Talman or Champion.—Good for earliest ; it is earlier than Hartford.
Teleyraph.—bunch medium ; very compact ; flesh juicy ; the best of all early kinds.
Underhill's Seedling.—Foxy ; discarded.
Venango, or Miner Seedling.—Foxy ; discarded.
Vergennes.—New, not tested ; expected to be a first class grape.
Wilder, Roger's Hybrid No. 4.—Hardy, healthy and productive.
Whitehall.—Early ; bunch compact ; berries tender, sweet.
Worden.—bunch large ; shouldered ; berries large ; flesh sweet ; good quality.
Wamington Red.—Milldews ; discarded.
Walter.—Not successful here ; discarded.

All in this list not marked discarded, I have now growing, most of them experimentally, and of such there may be some that will develop weak points and have to be discarded at last. I think it will prove true that only those varieties that ripen earlier than the Concord will be found profitable for general cultivation in Minnesota.

DISCUSSION ON STRAWBERRIES.

Mr. Cutler, of Sumter. I would like the opinion of members as to several of our newer varieties. How about the Glendale?

C. L. Smith. I like this variety for a market berry. It is very large and firm; have known 27 of them to fill a quart box; fruit stems large and very large hull; hence they bear handling and carriage. Will keep in good condition four or five days, after being picked: then you can turn them upside down and they will be as good as new. They sell well.

President Smith said the Glendales were larger than the Sharpless on the average, and he also found them excellent for shipping.

Mr. Bussee complained that they would not ripen at the tip of the berry.

Secretary Gibbs. I like the Glendale, but unless it has deep cultivation or plenty of water, the foliage is liable to sunburn. It evaporates moisture in great quantities, which must be supplied or it will not do well. Its foliage is very rank when well grown, and fruit large accordingly.

Mr. Sias. They are too tart.

Mr. Pearce. It gives the best satisfaction of any berry with me. It should be well mulched. It is very late—a most desirable quality and excellent for canning. It also has abundent pollen, and is a good fertilizer for the Crescent. Set in alternate rows with Crescent.

Secretary Gibbs. As to color of the strawberry, its firmness or softness, its texture, its continuous bearing throughout the season, and even as to its quality, we are forever at sea, and contradicting ourselves and each other, unless we state every time whether a berry is growing alone or in company with some other, and if in company, what its adjacent varieties are. I am satisfied that we not only make the pistillates bear by fertilizing with pollen of the staminates, as everybody knows to be the case, but that there is an immediate influence upon the pulp of the berry, and not only from staminates to pistillates, but from staminates to staminates. I will not take time to state the facts here, but will try to get some of them in shape for our Annual Report; and I ask you all to watch your strawberry plants and see what conclusions you come to. I think you will find in this suggestion a solution of some of our most puzzling things about the strawberry, and discover a remedy for the deficiencies of some of the sorts we so regretfully fail with now.

On motion of Secretary Gibbs, a vote of thanks was tendered to J. C. Plumb, of Milton, Wisconsin, for his valuable services at this meeting.

Prof. Porter, on behalf of the University of Minnesota, thanked the society for meeting in their rooms, and on his motion, the society then adjourned to meet in June next, at the call of the executive committee.

NOTE BY THE SECRETARY.

In copying out the notes of the foregoing discussions, which were not taken verbatum by the reporter, but in a condensed form, the Secretary has been obliged in many instances of doubt as to the fact or thought presented, to choose between striking out entirely or taking the chance of a possible misrepresentation. He has chosen the former as preferable in almost if not quite every case. If we are ever to have a thoroughly accurate and satisfactory report of our discussions, it now seems clear, after many years' trial of the abstract system, that we must employ a stenographer of experience, and take down everything verbatim—not to publish all—that would be impossible, but to have what the editor does select from each speaker as nearly correct as possible. Much of our very best matter has been lost every year under the abstract system.

RESOLUTIONS ADOPTED.

By J. T. Grimes:

Resolved, That an art gallery be established without expense to this society, to be known as the Art Gallery of the Minnesota Horticultural Society, to include the likenesses of members who have been made life members of this society, and the Secretary be instructed to notify such members of this action, or their representatives if deceased, and request portraits for the same.

By S. M. Emery :

Resolved, That our secretary be instructed to obtain from Prof. S. H. Folsom a paper on "Tree Culture, its Bearing upon Atmospheric Changes, Climate and Rainfall," for our next annual meeting.

PREMIUMS AWARDED AND PAID.

On fruits	$80 00
On vegetables	7 00
On pantry stores, etc	9 00
On seeds	6 00
On works of art	10 00
Total	$112 00

BILLS ALLOWED AND ORDERS DRAWN.

Secretary's office expenses to Jan. 5, 1884	$69 96
President's expense bill, year 1883	50 00
Librarian, salary year 1883	10 00
Repairs in library	15 00
Library expenses, express charges	3 05
J. T. Grimes, expense acc't, former years	81 00
Postage on reports, 1884	100 00
Secretary, 1st quarter, 1884	50 00
A. W. Sias, expense acc't	10 00
H. B. McKenney, printing	13 50
Lake City Graphic, printing	17 25
F. G. Gould, expense acc't	3 00
Reporter, copying and proofreading	60 00
Total	$482 76

THE McMAHON WHITE APPLE.

After adjournment the Secretary wrote Mr. Taylor, asking a fuller account of the McMahon White apple, and received the following reply. An apple of such beauty, quality and productiveness, that will succeed as a top graft on the Duchess, is worthy of trial:

FORESTVILLE, MINN., February 8, 1884.

Oliver Gibbs, Jr., Secretary Minnesota State Horticultural Society:

DEAR SIR: I would say in reply to your letter of inquiry, that the McMahon's White Apple (the name I understood Mr. Plumb to give it) was obtained by me from Wisconsin in 1872. I grafted a quantity of roots and planted in nursery row the same year. Found it about like Utter's Red in hardness. I do not think it is valuable for us, except for top working. Have experimented in that way with it for thirteen years, and have found it to work on the Duchess in the most perfect manner, making a union that none but an expert could detect, in a few years. I have fruited it for eight or nine years, and now have large trees perfectly sound in appearance, with branches four or five inches in diameter and twenty feet or more, high. The fruit is very large, white in color, and of the finest appearance; good sour flavor, and keeps until March if put up with care. I have exhibited specimens of the fruit measuring 17½ inches in circumference.

This is about all I can say in regard to it, except that I once thought it settled that it was the twenty ounce Pippin, or Ox Apple of Downing, which it is not. Many good judges have been mistaken in thinking they identified it as this or that variety. J. C. Plumb may be mistaken, although I judge and hope he is not, as I have held it on suspicion long enough, and want the name settled.

Yours very truly,

BARNETT TAYLOR.

MEETING OF THE EXECUTIVE COMMITTEE.

The executive committee met at the office of the Secretary of State, in the capitol building at St. Paul, on Saturday, February 23rd, at three o'clock p. m. There were present President Truman M. Smith, of St. Paul; Treasurer J. T. Grimes, of Minneapolis; J. M. Underwood of Lake City; J. S. Harris, of La Crescent; and the Secretary.

PRIZES FOR NEW SEEDLING APPLES.

The society's long considered scheme of prizes for the propagation of a long keeping winter apple was taken up, perfected and adopted as follows:

1st. The seed is to be planted and the tree grown in Minnesota.

2d. It must be as hardy as the Duchess of Oldenburg, and as much hardier as we can get it.

3d. It must be as productive as the Wealthy, and the fruit equal to the Wealthy in size and quality.

4th. The apple must keep as well as the Willow Twig.

5th. To encourage fruit growers to make the effort to produce it, a graded system of premiums is offered as follows, payable yearly for ten years to the three sorts that come nearest to the standard, entirely seperate from and in addition to the final award of $1,000.

For the first five years, payable annually — 1st best, $10.00; 2d best, $6.00; 3rd best, $4.00, and the 5th year, in addition to the foregoing, the following to the variety winning the highest cash aggregate of the premiums of the five years, $25.00; 2nd highest aggregate, $15.00; 3rd highest aggregate $10.00.

For the second five years, payable annually, 1st best, $25; 2nd best, $20; 3rd best, $15; and the 5th year, in addition to the foregoing, the following to the variety winning the highest cash aggregate of the premiums of the five years, provided the final standard of excellence is reached, $500; 2nd best, $300; 3rd best, $200.

If either of said varieties fail in the foregoing qualities, and yet remain in the rank of 1st, 2nd or 3rd best of all varieties entered, it will be awarded a reasonable premium according to its merit at the discretion of the society.

Entries must be made annually with the Secretary of the society in writing on or before the 1st day of September in each year, and specimens of fruit and wood of the tree, and cions for distribution; be furnished under such regulations as may be hereafter prescribed, and one or more experts to be appointed by the President or by the society will examine all trees so entered and report on them before the award will be made.

The Society has already a reserve fund of $600 at interest to meet their premiums when due, $200 more already due from the State to add to it; and in 1885 will reserve the remaining $200 to make up the $1000. The interest at six per cent. pays the annual premiums on the scheme as offered, and leaves a surplus to be be added yearly to the principal.

The other business done by the committee at this meeting was as follows;

On motion of J. T. Grimes, seconded by J. M. Underwood, the salary of the secretary was increased from $200 to $400 per annum, commencing with the first of January, 1884.

Arrangement of program for summer meeting referred to President and Secretary.

Secretary authorized to continue his Portfolio in the Annual Report, and use his discretion as to matters of interest to be printed therein, relating to Agriculture or Horticulture, within the established limits as to number of pages of the report.

The list of experimental stations and their superintendents, and the rules governing them, were revised and adopted as follows:

University Farm, College of Agriculture, Minneapolis, Prof. Edward D. Porter.

State Experimental Fruit Farm, Excelsior, Peter M. Gideon.

Alexandria, Douglas Co., Fred Von Baumbach.

Lake City, Wabasha Co., Underwood & Emery.

Northome, Hennepin Co., M. Pearce.

Litchfield, Meeker Co., G. W. Fuller.

Carver, Carver Co., Charles Ludluff.
Waconia, Carver Co., Andrew Peterson.
Moorhead, Clay Co., R. M. Probstfield.
Moorhead, Clay Co., F. J. Schreiber.
Minnesota City, Winona Co., O. M. Lord.
Lac qui Parle, J. H. Brown.
Farmington, Dakota Co., L. E. Day.
Owatonna, Steele Co., E. H. S. Dartt.
Forestville, Fillmore Co., B. Taylor.
Rochester, Olmsted Co., A. W. Sias.
LaCrescent, Houston Co., J. S. Harris & Son.

The Secretary is to search for new and valuable varieties of fruit, and distribute cions and trees to the stations, but none are to be sent to any station until it is first ascertained that the superintendents named have facilities for grafting and planting, accept the trust, and agree to report to the society annually, or oftener if called upon, and after three years' growth of any variety, that they will furnish to the society a reasonable number of cions for re-distribution and trial if wanted. The Secretary may with the concurrence of the President, expend not to exceed $50 per year for the purchase of cions or trees for the experiments at the stations. After the stations are supplied, any surplus cions or trees may be sent out to any other members of the society who are known to be suitable persons to grow them, on the same conditions as apply to the regular stations.

BILLS ALLOWED AND ORDERERS DRAWN.

M. Pearce, delegate to Mississippi Valley Horticultural Society........	$37.40
E. H. Cuzner, overpayment membership fee, refunded.................	1.00
E. H. S. Dartt, delegate to Iowa Horticultural Society................	23.10
A. W. Sias, delegate to Wisconsin Horticultural Society...............	4.75
Executive Committee, expenses of this meeting.........................	18.80

NOTE BY THE SECRETARY.

The winter apple we are seeking in offering the above prizes is believed to be within our reach; and it is also believed, that without systematic effort, based on the best knowledge attainable as to nature's laws of reproduction, variation and improvement in vegetable life, the chances are not better than one in ten thousand to get it; and it is further believed, that by using this knowledge we may not only get it speedily, but obtain it with a host of other good hardy sorts that while of lower standard, will yet be of great value to our state. The laws alluded to are not quite as well settled and as free from variation as in animal growth; but the facts so far found, indicate that the process for us in this case is to use the hardy tree of best form and of the common apple race (not the Siberian crab) for the seed-bearing parent, and fertilize the blossoms of this tree with pollen from the large, good, well-shaped, long-keeping variety, of the best color in fruit we can find, and also, other things being suitable, the hardiest in tree; in other words, that the female parent is most likely to impart constitution and form to the seedling tree, and the male parent the quality and season of the fruit of it. Those who have the facilities can reverse the plan or vary it and note the results.

Hand manipulation is the surest and most direct road to success, and the isolation of BOTH PISTILS AND POLLEN must be as perfect as possible. Top-grafting a hardy tree to a long-keeper (of same blossoming time) so as to intermingle naturally, and then planting the seeds of the hardy sort is liable to give a gain ; but the chance is more remote, as you have that "lusty stealth of nature," of which the bees and the winds are the agents, always to contend with and put aside your designs.

The new Russians will undoubtedly be the basis of some of the best work in this line, especially for seed-bearing parents. It will pay all our people to study the fruit trees and fruit blossoms, and read the Horticultural Report to assist them in finding "the motive and the cue" of thought in these interesting lines of study.

Members can be supplied with back numbers as well as the Report of 1884, and any person can become a member by sending one dollar to the Secretary.

MR. PEFFER'S PRIZE ESSAY.

The essay of Mr. Peffer having contained a number of confusing typographical errors, as printed last year, is herewith reprinted, and its careful study recommended in connection with the foregoing scheme for the production of a hardy, long-keeping winter apple.

PROPAGATION OF SEEDLING FRUITS.

By George P. Peffer, of Pewaukee, Wis.

Mr. President and Members of the Minnesota Horticultural Society:

Your offer of a prize for an essay on the above subject is presumed to apply only to such fruits as will withstand the severties of the seasons of the Northwest, and, therefore, I will mention as the first condition the selection of seeds that are grown in this climate, and, for tree fruits, they should be from sorts that are of moderately slow growth; at least, short-jointed and thick-leaved or woolly. The larger the leaf, and also, the earlier the new wood completes its growth in the fall, the better. To have a hardy variety, the leaves must have plenty of time to elaborate the sap, on its downward flow, to harden the new wood and put it in proper condition for the winter. The leaves of late-growing trees drop prematurely, and the sap being in a crude condition, the wood is injured by cold or by sudden changes of heat and cold, in the winter, and the trees are more liable to blight in the ensuing summer. Seeds of such varieties are imperfect, corresponding to the imperfections of the wood. For varieties from which to select the seeds, take either our natural seedlings or the most desirable of the Russian apples. By reproduction, every generation gets more used to our climate, and can be grown further north and west, with success. If the variety should be an early kind, every time it is reproduced it can be grown a degree further north, and be hardy. A summer variety grown a number of degrees that way will get to be a fall variety, and even a winter variety, if so far north as to have only time enough to ripen its wood and fruit. As a rule, the fruit will always be fairer. If any should be grown further south, the fruit is smaller and more subject to rust spots, scales, etc., and to cracking of the skin, especially such varieties as are russety, as witness the Russians. You can multiply any sort by grafting, but it does not make it any hardier. The increasing hardiness manifests itself only through the seed, and through seedlings the fruits are extended over larger ranges of latitude, or we would not have so many varieties in the world. In the natural process of reproduction by seedlings, there are rarely any multiplying of the same varieties owing to the mixings in the blossoms of different sorts, yet it is possible to make trees produce by their seedlings exactly their like in fruit. Isolation from other sorts of fertilizing pollen of any similar species, at the time when the flower-buds are ready to break open, is all that there is to be guarded against, and any tree that is blossoming in an orchard or garden, where no others of same species are near it, or, at least, so far away that no insects could carry pollen to it, will produce its like in fruit if the seeds are saved and planted; because the pistils will be fertilized from the pollen in the same flower. As an example showing the truth of this statement, I will give the following:

In the early days of Wisconsin settlement I knew of an orchard that was planted with small, one year old apple trees; the land was only cleared that spring; it was in 1843, and there was not room to put them all in orchard rows; so the most of them were planted in a nursery row, about twelve to eighteen inches apart. The land was white oak openings and was quite stumpy. Many of the little trees were destroyed by the plow, and by rabbits, and browsing from cattle, and but few were saved to be old enough to bear; but in the year 1849, one of them had a few dozen apples on, which were the Gray Gilliflower. Mr. Hilliard, the owner, gave me a few specimens of the apples to take home for a treat to wife and children. We saved the seeds. Eleven seeds were planted; eight of them grew; we set the seedlings out when two years old. In 1856, two of them bore apples, and they were the same as the fruit of the parent tree. The next year the old tree hung full of apples, and Mr. Hilliard brought us a dozen more. We planted these seeds also, and one of the trees bore fruit the same year as the first lot (1856), but these seeds had got pollenized by some other variety, and the apples varied in character, some in shape, some in size, and some in quality. In other words the apples from trees grown from the seeds of 1849, were all alike; from 1850, all different. There was no other tree in bloom in the vicinity of the Grey Gilliflower, when its crop of 1849 was set; but the next year, three or four of the adjacent trees of other sorts had come into blossoming, though they did not bear fruit, and their blossoms had pollenized those of the Grey Gilliflower, and the mixed and changed character of the progeny from seeds of that year was the result of it; not one of that planting is like the mother tree, while all of the first planting are exact reproductions.

This proves that blossoms self-pollenized, or fertilized from pollen of same variety and tree, will produce their like, and that varieties come from cross-breeding.

But if other varieties are wanted to improve them or make them longer keepers, or change them in color or size, there must be an understanding about the blossoms, because most of them have stamens and pistils on the same flower, and, has been already stated, will reproduce themselves if alone. Therefore, it is necessary to understand which are the male and also the female organs, and find which predominates, and what influence the male or female has on the fruit, seed or stock, or constitution and hardiness of tree. If we do understand it, we can almost to a certainty raise or make any desired improvement, either in fruit or tree, or both.

Now, to raise a seed or seeds that will make a hardy tree, and at the same time improve the variety and be a good bearer, we must select for the female the hardiest and the best form of the tree, and form of fruit, and for the male, the earliness or lateness, quality of flavor and productiveness. For culture in fruit where stamens and pistils are in one blossom, and we have an early variety that is perfectly hardy and we wish to improve it and make it a late keeper, we must select for the female the tree that is the strongest and hardiest of the two varieties we like to improve, and when it is just commencing to blossom, cut off or remove the stamens below the pollen sacks or anthers just before the flower leaves or petals are opening in the morning, upon a spur or an upright limb or branch that is at an angle, so the spur with a bunch of flower buds can be covered with something that will protect it against other pollen falling upon it, or brought by bees or insects of any kind. A small glass bottle or jar, such as a quinine bottle or something of that kind, will do. Now, get a spur or bunch of blossoms that you want to use for the male—if already opened, all the better ; but if the trees are quite a distance apart, best use two bottles ; and put the second one on the spur before you remove it in order to save all the pollen, then go to the first tree you had protected, and change the bottles at once ; put this second one (that is, the one from the tree used for the male or fertilizing side of the operation) over the spur where the stamens had been removed, cover the mouth with something to keep it closed, and as soon as the sun dries up the dew, and warms the air, the pollen will be ready, and then, by jarring or shaking the limb, the pollen will be seen flying all over inside, and the fertilizing is done.

Now, here lies the mystery: Which variety does control or influence the new growing seed? It will be observed that the fine dust of the pollen had settled on the tips of the pistils or stigma, which had a little shiny liquid on the tips, which, adhering to the pollen, dried it up, and the seed now forming, of which each has a stigma or open tube that reaches from the pistil to the forming seed in the core, ripens and contains the mixture of both varieties. If all the pistils are equally supplied with pollen, all the trees raised from these seeds would bear fruit alike, but as that is not often the case, each individual seed will have the predominance of either parent in a greater or lesser degree accordingly as they were fertilized. An apple blossom has generally five pistils. Each of them has from two to five stigmas, according to the propensity or vigor of the tree. Each stigma is formed from an embryo seed, and if fertilized will produce a live seed or germ. A germ has in itself the power to expand and grow and reproduce again. Each seed is an independent individual, and capable of varying from every other one. Therefore it is necessary to guard against having the blossoms exposed when they are opening if you want to improve the variety by this process. As to varieties to work with, I should use the Duchess or other Russians, or any of our Minnesota seedlings that are hardy for the seed raising, and use Wallbridge, Utter, or any next hardy sort of good quality for the sort to pollenize with; or if hybrids are wanted, take the hardiest of the crabs for the female and any of the other named apples for the male. In this way an abundance of home-grown apples can be raised. All there is required is time and a careful hand to do the fertilizing.

QUALITY OF APPLES.

If we inquire at any commission house in Chicago or Milwaukee for the best table or dessert apple, they invariably will say we have Spitzenberg or Baldwin, if they get their supply from New York state.

Now the Spitzenberg, it is true, has the highest flavor, and the Baldwin a little of the same, but the flesh is hard and tough and indigestible. It is a mistake to call them dessert apples, as they are lacking in juiciness and dissolving properties. In my estimation, Jonathan, Wealthy, Northern Spy and Fameuse, are nearly or quite equal to the Spitzenberg in flavor, but how far superior they are as dessert varieties any one familiar with them well knows. The reason of their superiority lies in their crisp flesh, which is yet so tender as almost to dissolve in the mouth. The more we get acquainted with the Wealthy the more we value it. I might mention the Pewaukee, but the flesh is coarser and is more for culinary use. For pollenizing in cross breeding these varieties would be preferable as named in their order; also Rawle's Janet or Westfield Seeknofurther could be used, if none of the others could be had. A few cions of such, grafted on some hardy standard or seedling kinds, would soon give the blossoms to work with.

For planting trees for cross breeding by distribution of pollen by wind and insects, little arrangement is necessary, as it is known that pollen will fly, or be carried a long way and pollenize any blossom that is just on the point of opening.

If any had already been open on the same tree or others in the same orchard, the pistils are just as likely to be fertilized from a variety forty rods, or even eighty rods off, as one close by or even from the same limb. Most buds throw out, from two to five, or more flowers or spikes, but do not all open at the same time and work naturally like sprouts on a potato; however, it would be well to set, perhaps, rows alternately with such trees as are selected for the mother or for the fruit, the seeds to be saved for replanting. If the wind should be from one side of the orchard for two or three days, when they are in bloom, the pistils on that side of the rows would mostly be fertilized from the neighboring pollen from that direction, except where insects carry the pollen against the wind. The only practical way to make sure of getting anything like the varieties wanted, would be to try hand work, either on a small scale as described, or by having the variety selected for the mother, surrounded by the different varieties to be used as males, and have a canvas tent to cover the first two trees, one year. The next year with the other, etc., so in four years, the same tree can be fertilized four times, and have all the fruit take only after the two varieties inclosed the same year. A tent could be used over the mother tree, and cut branches, full of blossoms, and inclose in the tent. Of course the tents have to remain until the petals and pistils dry or wilt. In this way a good share would be just what we would expect.

Always save the seed of the early variety, if that was the one that was hardiest and the best tree, if you want the new fruit to be after the male and a keeper. On the contrary, if you want early, save the seed from the opposite variety.

To plant the seeds for new varieties, prepare your soil the same as if you planted trees from a nursery. Stake out the ground and work the spot deep. The larger the hole and deeper the subsoil, from the surface, the harder you have to pack the soil when you fill it up again. Set the stake, or anything else you are using for a mark, then plant two or three seeds on the north side of it. If they are fresh plant them in the fall and cover about one inch with loose earth or mould. If dry, plant early in spring soaking the seeds first, and cover lightly, say half or three-eights of an inch deep. Keep clean the same as your corn, potatoes or any hoed crops. If all the seeds should come up, remove the surplus either the first or second year.

To enlarge the orchard, transplant them, or fill out where any are missing; taking good care in digging them up to save all the roots possible. Unless you do so, those not disturbed will get the start of the transplanted ones. Mulch the first winter if on an exposed situation. Do so any way, so as to be sure the frost will not go below the tap roots. The only success we will have in raising good orchards will be by planting seedlings one year, or the farthest, two years old.

Transplanting should be done thus early because the main tap root is not disturbed. The further the soil is loosened the faster and farther these roots will go down, and the safer the tree will be.

The roots will not be killed because parts of them reach below frost, and if it should freeze up dry in the fall, those roots will supply moisture, when the frost is coming out of the frozen part, even if the earth takes it up.

The small trees should be watered in the fall if not mulched, because the tap root may not go far enough to be safe from frost.

Drouths are no injury to deep rooted trees. I am convinced pears of hardy kinds can be grown in the same way, because the farther the tap roots go down the lesser will be the surface roots, and certain changes in the weather will not excite the trees, and stimulate to excessive growth, and thus the sap can be controlled and the trees are saved against fire-blight.

If the seedlings should be raised in a small patch by themselves, they should be well taken care of and set out in the orchard the second year, with all the roots that can be saved on taking them up, especially the centre or tap root. It they should be wanted to graft new varieties (say the hardy winter Russian, if we ever get such) there would be a little time gained, either in grafting before planting out, or any time afterwards.

To take care of such an orchard and have it do well, it should be located on high or naturally drained clay or limestone soils and sloping to the east or northeast.

The cultivation should not stimulate overgrowth, and the laterals, or side branches, should be pinched in occasionally to form a good head. When three to four or five years old, if the trees show no blossoms, tie a wire around one of the lower branches, or girdle one, to make it sick. Do this in June or July, and the branch will get filled with blossom buds, and bear the next year. Always leave the lower branches shortened in to protect the trunk of the tree, and only remove them gradually, as the limbs you are training to form the head of the tree expand to shade the body.

Some will say this is rather a small business, to start an orchard in this vast northwestern country. We acknowledge it is rather a small beginning, but should the amateur be patient, persevering and industrious, and can estimate the value of small things, above all have a love for his business, he will not fail of his due reward. Other crops may be raised between the rows. These may be either of small fruits, such as currants, strawberries, or any other crop that will not interfere with the growth of the trees. Only a short time of patient industry, and the seedling orchard will produce its fruits.

SECRETARY'S PORTFOLIO.

Deferred Papers, Reports, Appendix, Notes, Extracts, etc.

ORCHARDING IN NORTHEASTERN VERMONT.

By Dr. T. H. Hoskins, of Newport, Vermont.

Vermont is often spoken of as a cold state, but the Champlain Valley and the lower half of the Connecticut Valley are not too cold to produce the great commercial apples of New England, the Baldwin, the R. I. Greening and the Roxbury Russet. Peaches are grown on the commercial scale near Brattleboro, and for home use on Lake Champlain as far north at least as Shelburn, while plums and pears of many varieties are grown for market about Burlington, and upon the islands of the lake up to the Canadian line, 45° north latitude. But in the mountains of northeastern Vermont the case is very different. In all of Essex, Orleans and Caledonia counties it is impossible to bring trees of any of the three above named varieties to bearing age, while no great success has yet been met with in growing plums or pears. Not only are the Baldwins, Russets and Greenings excluded by the climate, but nearly every variety of apple known and valued in southern New England, and classed as hardy there, fails if not to yield fruit, at least to do so profitably, in this elevated and wind-swept region.

From studying the reports of your society I am inclined to believe that in Minnesota exceptionally cold and destructive winters occur somewhat oftener than in northeastern Vermont, and that perhaps spring frosts do more harm to blossoming trees in some portions of Minnesota than with us. Minnesota is a large state, and the distance between its northern and southern boundary corresponds to a considerable difference in climate, so that I find some apples reported as doing well in Olmstead county, such as Minnesota Greening and Rollins' Pippin, not quite iron-clad with me on lake Memphremagog. On the other hand I see that there are portions of Minnesota where the Wealthy, and even the Duchess of Oldenburg, both thoroughly hardy here, are complained of. Therefore my experience, while it may be of use to some, can by no means be taken as a guide in Minnesota without considerable allowance not only for latitude but for longitude.

It is now seventeen years since, in 1866, I determined thoroughly to test the truth of the popular belief in this section of the state that apples, aside from Siberian crabs, could not be grown here.

I had one thing to encourage me. In the early settlement of the country, at the beginning of the century, seedling orchards were grown, and up to between 1840 and 1850 native apples of this class, including some kinds of considerable excellence, were produced in great abundance. These old orchards, many of them at least, became feeble with age, and all trees, old as well as young, were badly wrecked by being loaded and broken down in a heavy sleet and wind storm in 1848. After that the attempt was made to start new orchards, but instead of using seedling trees, as the pioneers did, young stock was bought from pedlars of New York trees,all of them varieties totally unfitted to the climate, except an occasional Fameuse, Talman Sweet and Red Astrachan, and these not strictly iron-clad. Repeated failures with these New York trees led many to believe that the climate had changed, owing to the removal of the forests. As a matter of fact this has made the climate warmer rather than colder, taking the yearly average, and there is no ground to believe that the winters are colder.

It was long before it began to be understood that all kinds of apple trees are not hardy alike, and that we must have hardy kinds. When this did begin to be realized, nobody seemed to know where to look for hardy sorts. When I began I determined to test everything called hardy, and in the first three years I had set out from three to eight trees each of over a hundred kinds, reported hardiest in Vermont, New Hampshire, Maine and Canada. Among these I found only three kinds that did not seem to mind anything about the climate. These were the Duchess of Oldenburgh, Tetofsky, and Peach of Montreal. In the meantime I was corresponding with western fruit growers, and searching the remnants of the old seedling orchards wherever I could hear of any. Out of a great many sorts from the west, I found only Plumb's Cider that endured our climate well, until I got the Wealthy, and these two to-day, constitute the only really valuable contributions to my orchard from the west. Many others indeed do *tolerably* well, but "tolerably hardy" fruit trees in a climate that demands "ironclads," are not the source of much satisfaction.

In 1870, I obtained from Washington cions of about twelve kinds of the Russian apples imported at that time, and in growing these, I soon realized that I had struck upon a strain of apples that cared nothing for cold weather. From these, and from others of the same importation which I got from those who had received them, the question of hardiness being eliminated, I have had only to choose for quality and season. For very early fruit, the only hesitation has been between the nearly similar sorts of the Yellow Transparent family, including the White Transparent, Grand Sultan, Charlottenhaler, Sweet Pear and several others. On the whole, I now think that I prefer the Yellow Transparent, though Charlottenhaler is somewhat larger, and White Transparent of rather better quality. The Yellow Transparent is the most vigorous tree, and the fruit, in good land, is large enough to sell well. The season of all of them here, is the last week in August. Picked just before coloring, they ship and keep well for a summer apple. Tetofsky comes in the week after Yellow Transparent, and is objectionable only because it drops badly before ripening, shows bruises, and does not keep so well. Next we have the Duchess of Oldenburgh. I say next, but in fact the Duchess is our first market apple, the windfalls being large enough for pies, by the first of August, and its market season extending from then to the third week in September. The second week in September, Peach of Montreal comes in, a profuse bearer of an elegant looking apple of good size and first-class dessert quality when fully ripe. But alas, when fully ripe will not ship, and it is therefore valuable chiefly for a near market. It is also somewhat subject to spotting, not being nearly so fair as the Russian apples, although Prof. Budd thinks it is a Russian. Is is certainly as hardy and thrifty, and productive as any of them.

Among the later fall Russians, I am strongly attracted to the Switzer, It is as large and handsome (though not so dark a red) as Red Astrachan, and far more hardy, equaling the Wealthy in that respect. The only fault I have yet found in it is, that it is sometimes slightly attacked by twig blight, yet it only loses a few twigs when crabs near it are wholly killed. The fruit ships well, and keeps several weeks after maturity.

Succeeding Switzer comes the Canadian apple, St. Lawrence. This, except the Peach apple, is the hardiest Canadian I have ever found. It is late in coming to bearing, and requires a good soil, but is productive when it gets to it, and fills a gap between Switzer and Fameuse, keeping well nearly through November. The fruit is as large as Duchess, more flattened, and heavily striped with a darker red. It cracks and spots, in some seasons badly. The tree is pretty nearly as hardy as Wealthy.

Of about the same season as St. Lawrence is a Russian which came to me from the Department at Washington as the Golden White. Excepting perhaps, Plumb's Cider, this is the most vigorous tree in my orchard. The leaves are large and thick, with a heavy white down on the under side. The tree has been growing so hard that it is late coming to bearing, but it promises to be productive. The fruit is round, somewhat irregular, of medium size or larger, distinguished by a very small cavity, often none, with a fleshy stem. The color is a pale green, with some pale red on the sunny side. The flesh is white, soft, of a very mild acid, and though not rich, may be called very good. It attracted some attention at the fair of the Montreal Horticultural Society in September, and was thought to be a promising market fruit. I think some have this variety under a different name. If so they will easily recognize it by the above description.

Among fall sweet apples, the only one of much value that I have found is a Russian, the Prolific Sweeting. The tree is a good, upright grower, late in coming to full bearing, but then prolific, a handsome, large round, or slightly flattened yellow apple, of excellent quality for eating or baking. I desire nothing better of its season, September.

The Fameuse is an apple which we try to grow here because it is so extremely popular. Our trees are never healthy, still they hang to life and continue bearing as long as a limb is left. On the whole they yield some profit, though half of the fruit is unmarketable from spotting. They bring a good price, and are in eating about a month before the Wealthy. They do not keep, usually, beyond New Year.

Here I want to mention a Russian apple of which I have but a single tree, and the name of which I am not certain of, though I think it may be "Longfold's Apple." It has only borne for three or four years, and did not attract much attention until last year, when it bore a full crop, and proved to be a keeper. It is a little below Fameuse in average size, but shaped like it, of a darker red, and covered with a blue bloom like that of the Hyslop crab. It is perfectly fair, not so soft-flushed as Famuse, but of an excellent sub-acid flavor, with a good deal of richness, certainly, for a Russian. It keeps perfectly until spring. The tree is a moderate grower, but handsome and thrifty. This is the first winter Russian that I have fruited, and is an agreeable surprise. I have two other winter Russians of the 1870 importation, the fruit of which I have seen, although my own trees have not yet borne. These are the Borsdorf and the Little Seedling. Both are long keepers of medium size, and Borsdorf seems to be a very good apple, much preferable to Ben Davis. Little Seedling is a greenish yellow apple that keeps till apples come again, but is only a cooking apple. These however are very interesting, because they *prove* that there are long keepers among the Russians, which many are slow to believe.

And now I come to Minnesota's one grand contribution to our stock of iron-clad apples, the noble and glorious Wealthy. With me it grows to perfection, both trees and fruit, the latter running fully as large as Baldwins, handsomer, better for dessert, and keeping just as well side by side in the same cellar. I have now 400 bearing trees, and I just love to take the croakers who have been telling me so long—"You can't make apples pay in this cold country"—right in amongst them the last of September, and see 'em "give it up." There is a seedling of the Fameuse from Canada, the McIntosh Red, which for several years I have thought might be a rival to the Wealthy. In quality it leaves nothing to be desired, and it keeps pretty nearly as well, but like its parent it spots and cracks, and as a market apple for profit the Wealthy sails right round it without any trouble at all. On deep rich soils like those of the St. Lawrence river banks, where alone I have seen Famuese and St. Lawrence grow in perfection, the McIntosh, I have no doubt, will be "just splendid." I have seen specimens of it as big as a pint bowl, that were everything one could ask for. The tree is somewhat hardier than Fameuse. Among the native seedlings of this vicinity I have found two that are valuable. One, the Magog Red Streak, is rather supplanted by the Wealthy, yet not altogether, since it is a choice pie apple as well as a good eating apple. The tree seems perfectly hardy, the shoots never winter-killing, but it is somewhat subject to bark blight at the junction of the limbs, thus making some of the trees unsound. It bears not young but abundantly, the fruit being medium to large, more or less ribbed, yellow, with read streaks on the sunny side. Keeps well, but rather unevenly.

My second native, Scott's Winter, I like better and better as I have longer experience with it. The tree is iron-clad, free from defects, except that it is subject to bark-splitting at the ground while young. Its growth is vigorous, and it begins bearing as early and bears as much as the Wealthy. In size it is a good medium; the fruit is roundish oblate, dull yellow, heavily striped and often covered with dark red. It keeps from two to three months longer than the Wealthy, or until the middle of June with me. It does not begin to soften much until April, when it becomes very good, a brisk, spicy acid, mellowing to sub-acid in May. It is preferable to and more salable than the smaller russets, besides being hardier. I have about 300 trees of this variety.

THE FUTURE OF ORCHARDING IN THE PRAIRIE STATES.

BY PROF. J. L. BUDD, AMES, IOWA.

The apple, pear, and most of our cherries and plums, are not natives to our continent, and their introduction into the states west of the great American lakes has not been guided by the scientific skill in selection which characterizes such work in the colonies of all the governments of Europe.

Without exception, the scientific observers connected with the early surveys of the illimitable prairies of the west, interpreted the absence of the conifers, the rhododendrons, the mosses, and all the characteristic trees and plants of the more equable regions nearer the coasts and lakes, to mean an intercontinental climate of extreme changes in temperature and humidity.

In those early days of prairie settlement, such men as Judge Knapp, Dr. John A. Kennicott, Robert Russell, and J. G. Cooper, unitedly expressed the opinion that the world had no counterpart of our plains, in soil and climate, except on the great plain which covers, like a blanket, fully three-fourths of Europe on the north-east. These men, in connection with Arthur Bryant, Hon. G. P. Marsh, and many others, also predicted, in those early days, that unless systematic timber planting was commenced and carried forward, to offset the destruction of the dense growth of prairie grass, and the effects of opening the clogged drainage centers of the primitive prairies, consequent upon occupation and cultivation, the already fickle and extreme climate would change for the worse as the years went on.

With such clearly expressed views as to the real nature of our climate, it seems passing strange to the people of Europe so long accustomed to well equipped and endowed experimental stations, that we have never attempted to row our own horticultural boat, but have permitted the nurseries of the eastern states to do our importing of trees and shrubs, from the mildest portions of southern Europe, mainly, indeed, from the nurseries of Thomas Rivers, in England, and Andre Leroy, in southern France. Our plan really has been to try everything which our eastern friends had to offer, and hold fast to that which was good. Unfortunately for our interests, south Europe has very few varieties of the fruits which will long survive in our climate, and the very few we have received are really strays from the east plain of Europe, or their seedlings, grown on our own soil.

As instances of real iron clads over broad expanses of our prairies, all will think of the Duchess, Gros Pomier, Fameuse, Drap de Or and Wealthy; all but one strays from the east plain, and that one beyond doubt a seedling of the Duchess or Tetofsky.

Of pears we have not one tree iron clad, and the nearest we have —the Besi de la Motte and Flemish Beauty—are from Poland, on the borders of the east plain, but modified by the breath of the gulf stream.

With cherries we are quite as unfortunate. The Dukes and Bigarreaus of the east utterly fail with us, and the early and late Kentish and English Morello, in addition to short life of tree and irregularity of bearing, are far lower in quality than any one of the Griottes grown by the train loads on the plains north of the Carpathians.

As to plums, without thanks to our eastern friends or to south Europe, we have been more fortunate, as Nature has provided us with better native varieties than I know to exist elsewhere.

Beyond doubt, we have lost millions of dollars, and an untold amount of time and faith in unsystematic trial of fruits adapted to more equable climes. Surely the time has come when we should unitedly give trial to fruits of like climates, so far as they are commercially obtainable. Perhaps ultimately our favorite fruits will be seedlings of those we first introduce ; but the only safe line of experimentation is based on the assumption that the future favorites of our orchards of the apple, pear, and cherry, will come from climates fully as severe as ours, or will be the seedlings of such varieties grown on our own soil.

With the hope of aiding in this systematic experimental work, so much needed, I will offer a few suggestions, based on a careful study of the climate, soil. and fruits, of inter-continental Europe, in the smmer of 1882. These hints are formulated on the well known fact that every part of the Mississippi basin is subject to extreme summer and winter varieties of temperature and humidity of air, consequent upon the varying winds, and that trees for the southern and middle sections of this basin must have all the requisites of those for the north, except the mere ability to endure a very low temperature.

Southern Illinois, Missouri and Kansas, may safely experiment with the apples, pears, cherries, plums, apricots, nuts, ornamental trees and shrubs, of the plains of northeastern Austria, for the western portion, and of Transylvania for the eastern portion. Here are found late keeping varieties of the apple, comparing favorably in size, beauty, and quality with the best known, growing on trees with foliage as perfectly adapted to a varying air as our Duchess. Here also are found many varieties of the pear with the perfect foliage of the Chinese sand pear, yet producing fruit nearly equal to the best sorts of France and Belgium. We have less reason to believe they will be subject to blight to a serious extent, as for ages they have been subject to inter-continental extremes like those of our valley.

In this region will, in like manner, be found the coming cherries for the dry belt where the extreme winter temperature does not reach lower than from fifteen to twenty degrees below zero.

The plains of Galicia are checkered with lines of cherry trees along the sides of all highways, and marking the division lines of estates to an extent not found in many parts of Europe. The varieties, too, are all new to an American. A careful study of their leaf structure, fruit, habits of growth, etc., will convince the most skeptical that we have gone sadly astray in selecting fruits for an interior prairie climate. The Griottes, with small pendulous branches, and fruit with colored juice, are generally used for roadside planting, as the trees do little shading on account of their small size, and the fruit can be used for dessert, culinary use, and for the favorite drink of high and low known as "Kirschwasser." In every respect the fruit is far superior to our Kentish cherry, or any one of the morello type we know. In the fruit orchards, and on the grounds of land proprietors, we find many varieties of a race of sweet cherries not known to us. With the round spreading top of the Morellos, they have the excellent fruit of the tall growing heart varieties, and a leaf that can defy our summer changes. Some of the Amarels of this region seem a cross of this sweet cherry with the form of the Morello of which our Lieb is a type.

The apricots of Galacia and Transylvania, and their form of English Walnut (juglans regia) are equally worthy of trial in the Missouri belt, together with their filbert, currants, gooseberries and even grapes.

Though we have failed with the French grapes, the northeastern varieties are well-worthy of trial, as their foliage will stand our air quite as well as our native Labrusca. We saw on the Volga many tons of dried grapes from northern Persia and Bokara, which were infinitely superior to any of our home sorts. Where they will endure the winters they are eminently worthy of trial.

In this region no hardier peach is found than those we have. The coming peach for the Missouri belt is from northwestern China. While equal in fruit to our best sorts, it is able to endure greater extremes of temperature.

The belt across the Mississippi basin corresponding to southern Iowa, may experiment with the same races of all the fruits, and from a portion of the same great plain, *but farther to the east.*

The provinces of south Russia, east of Poland to Kiew, are well supplied with such choice fruit, and the soil and climate are as nearly identical with ours as they well could be.

Many of the varieties of the Galicia belt will not be found, but their places are taken by others but slightly, and if at all, lower in the scale of value. The most positive change is with the pear. Many of the best dessert varieties here become tender, unproducttive and short lived, and their places are taken by slightly coarser varieties of the Bergamot and Grucha type. The best of the Griotte cherries are still found, and many varieties of the Glaskirke, and a form of the Jeans much like our Dukes, but with different leaf and a lower, more spreading top. The juglans regia is still productive, but is sometimes injured by the test winters.

For the belt across the valley corresponding *to central and northern Iowa*, the fruits of the black soil prairies of the great provinces of Orel, Koursk, Varonesh and Saratov, in central Russia, will best meet the requirements of soil and climate. Apples, pears, cherries and plums are yet found of such size, appearance and quality as would surprise any American horticulturist suddenly set down in the midst of one of their great commercial orchards. The visitor will rarely find a variety of any of these fruits which he found six hundred miles eastward. The very few exceptions, such as Autonovka, and Longfield apples, and Bessemianka and Red Bergamot pears, we are told at once are strays from central Russia, thriving equally well in a less extreme climate, as does our Duchess apple. Excellent forms of the Griotte cherries are still found and many varieties of the low-growing sweet cherries and Amarels are grown, with greater or less satisfaction, depending upon soil and mode of growing. The apricot and mulberry are yet grown in considerable quantity, but the varieties are lower in quality for dessert use than farther west.

The belt corresponding with *Minnesota, up to the 45th parallel*, including southern Dakota and northern Wisconsin, will reach the highest attainable success with the fruits of Simbirsk, Penza, Riazan and Tula, on the north line of the black soil section of Russia. The visitors to these little known provinces, reaching up to the 55th parallel of north latitude, will be surprised to find so many varieties of excellent apples for all seasons, and so many variations of the indigenous Bergamot and Grucha pear, most of which are excellent for culinary use, and a few are from fair to good for eating. The only forms of the cherry grown in quantity are of the Griotte race, and the trees are grown in commercial orchards in *bush form*, with several stems, and pruned on the renewal system of taking out the old wood. In size, flavor, and amount of grape sugar, they far excel any one of the Kentish type found in south Europe.

To those who may conclude that the apples of this high latitude in Europe will materially change their season of maturity when grown in the Minnesota belt ten degrees farther south, it will be well to suggest that the prevailing summer winds of this part of Russia are from the southeast, coming up from Arabia, Persia, and the heated steppes of southeastern Russia. Hence the average summer temperature is really higher than that of the Minnesota belt across our valley, while the winters are much colder and with less average snowfall.

In the extreme upper portion of our valley *in northern Minnesota and Dakota*, even in the great valley with the northern trend at Lake Winnipeg, the possibility of successfully growing the apple, pear and cherry exists. The ancient provinces of Kazan, Nishny, Novgorod, and Vladimir, even north and far to the east of Moscow on the fifty-seventh parallel of north latitude, grow apples for all seasons, of excellent quality in a commercial way. In this coldest orchard region of the world, the little trees seem as hardy as the Siberian crabs, yet the fruit sells well in Moscow in competition with that from the south.

The far northern pears of this section are quite as hardy in tree, but the fruit is too low in quality for consumption in the large cities; yet it is grown in great quantity for culinary use among the peasants, and for exporting to Perm on the northeast verge of the plain. As an ornamental tree, this far northern form of the Bergamot has much merit, and it gives us a hint of possibilities in the way of originating, by crossing, pears of excellent quality for the extreme Northwest.

The cherries of this region have had a historic record for centuries. In Vladimir one hundred and fifty miles east and north of Moscow, they are grown in quantity too surprising for popular belief in our valley. Though somewhat smaller than the best Griottes of the south parts of the plain, some of the Vladimir varieties are nearly sweet and of decidedly good quality for any use. That they can be grown as far north as Lake Winnipeg, in Manitoba, we do not for a moment doubt.

Plums approaching our Damson in quality, and much resembling it in size, form and color, are grown in quantity in this far northern section of the steppes. That they will prove an acquisition to the extreme Northwest, is beyond doubt, if the curculio will respect them to the extent of giving us an occasional crop.

These hasty suggestions as to the adaptation of the fruits of special portions of the greatest steppe section of the world to special belts across the prairie states of the West, must of course be of a general character. In practice they would be modified by the varying soil and climate of the east and west portions of each belt, and the belts would overlap with special changes of soil, elevation, exposure, etc. The only purpose is to outline some profitable lines of work for the experimental stations now in process of organization and development in all the states of our valley. We have learned that the process of acclimation is a tediously slow one with our trees, and I believe our people are about ready to encourage the policy universally accepted by the European governments in the management of their colonies viz: The introduction of cereals, grasses, fruits, shrubs, etc., from like climates and soils if they can be found on the earth's surface.

With the limited pecuniary means at command we are doing what we can in the line indicated on the grounds of the Iowa Agrecultural College at Ames. We have now growing specimen plants of the apple, pear, cherry, plum, apricot, peach, juneberry, walnut, ornamental trees, shrubs, etc., from every part of the great east plain of Europe I have named. Their summer and winter behavior for the past two years in our climate has been exactly in accordance with what we might expect from their relative position in their natal home. To briefly illustrate: the leaf of the Richmond cherry has been defective with us for the last two years, and last winter the trees were killed to the snow line. On the other hand, the Griottes and the Russian Glaskirke varieties have maintained perfect foliage, and have been unharmed by the test winter. In like manner the Flemish Beauty pear has not had for the past two summers a single leaf free from brown fungus on the under surface, and last winter the trees were either wholly killed or so lowered in vitality as to be really worthless. The Besi de la Motte, from the edge of the great eastern steppe, has maintained healthy foliage, but its wood was slightly colored by the test winter, yet it has made rapid and healthy growth the past summer. The Bessemianka, Trukavetka, and other pears from central Russia, have maintained perfect foliage—except slight injury by the pear leaf mite—and the terminal points of the shoots were as clear and bright last spring as the wood of the Russian poplars. Our apples of the grade of hardiness of Ben Davis, Jonathan and Dominie, were defective in leaf for the past two years, and last winter were irreparably ruined. On the other hand, our old varieties from the east plain, or their descendants, and over two hundred varieties recently imported, started from the terminal points where grown on rich garden soil.

Yet our collection *is too varied for any one experimental station of the West*, as it embraces varieties which will do best in the Missouri belt, and varieties which should do best in the belt of North Dakota and Minnesota. If the experimental work could be distributed, and each of the belts across the valley I have tried to indicate could experiment with the products of its corresponding section of the east plain, the work could not fail to result in advancing our horticultural interests. So far, in talking of Russian fruits, we have not taken into account the enormous extent of the empire. We do not want the fruits of St. Petersburg, or of any part of the coast section within 300 miles of the Baltic. That we do want the fruits of the provinces named in this connection, I am equally certain, if properly distributed over our great valley. We must never forget that we must have in our valley, from the Missouri belt northward, varieties of all the fruits that will maintain perfect health of foliage, or we cannot expect paying crops of perfect fruit. A tree may endure our winters passably well, yet on account of leaf trouble during our dry hot summers, fail to develop the cell structure in the wood in the perfect way needed for holding and perfecting the fruit crop. With the advent of varieties as perfect in leaf as the Duchess apple, the Bessemianka pear, and the Vladimir cherry, we may expect a show of blossoms to be followed by perfect fruit.

The crying want of the Mississippi valley is well endowed experiment stations. With their aid we may be able to walk without the leading strings which so far in our history have been furnished us by the nurserymen of the eastern states.

[NOTE.—Foster, in his work on the Mississippi Basin, compares it to the Russian steppes, and says: "Starting from Lublin, in Poland, about latitude 51°, and going eastward to the river Lena, we traverse 130 degrees of longitude, or more than one-third of the earth's curvature, without meeting an elevation that would precipitate the moisture of the southwest current." Over this anciently occupied interior plain fruits are grown.—J. L. B.]

MARKET GARDENING AT LAKE MINNETONKA.

To the Members of the State Horticultural Society :

When our Secretary assigned me the task of reporting on market gardening and small fruit at Lake Minnetonka, I think he did not comprehend the extent of the work before me.

I will try to give you a few outlines, but not a detailed report. You doubtless have seen the lake or a part of it, but can form but a faint idea of the size and amount of traffic carried on there in the short space of time the summer guests are with us. We have a lake with 150 miles of coast, and according to the Minneapolis Tribune of Jan. 3d, 1884, we have over $1,600,000 expended for the accommodation of tourists; and you are well aware that people come here to eat and regain their health.

The season opens about the middle of June, and closes the last of August or the first of September, which makes it bad for gardeners to supply all of their demands. I can no better tell you the amount of demand, than to give you the figures of two items that I furnished the Hotel St. Louis in one season: Green corn over 1100 dozen, and of peas, 70 bushels. We have to raise a general assortment from green corn and peas, down to gumbo and garlic. We have now six regular gardens around the lake; one located on the north shore below the Lafayette Hotel, one near Mound City, three near Excelsior, and my own at Northome, near Hotel St. Louis, besides quite a number of others that raise more or less of vegetables to sell. Still a large amount is shipped from St. Paul and Minneapolis. We ship more berries than are consumed here at the lake.

The past season has been a favorable one for both strawberries and raspberries, and at very good figures too. I cannot tell how many there are engaged in raising berries. I find in looking over my book of sales for the past season, my first sale of strawberries was June 20th, and strawberries continued until raspberries began to ripen. The last sale of raspberries was Aug. 24th, making the season of berries over two months.

I cultivate the raspberries the first season after setting, and after that I mulch heavily with bagasse from my cane mill, so that they do not need the hoe.

I have a patch of Philadelphia Red that have fruited eight seasons, with a full crop the last season, and shall let them stand until they fail to pay.

KNIGHT H. WHIPPLE.

Northome, Jan. 15. 1884.

APPLES OF WINONA COUNTY.

BY O. M. LORD, OF MINNNESOTA CITY.

The Horticultural Report of 1873 gave a flattering statement of fruit prospects for Winona county, which at that time was not considered as exaggerated; but with the experience of the last ten years with apples, the statements made in that report seem almost incredible. Many of the orchards which had done so well up to that time and which gave such fine promise for the future, do not now exist.

According to the statistics made by the assessors for the year 1879, the number of apple trees in the county was 65,000; the number in bearing about 25,000, and the number of bushels produced about 8,000. These statistics are not wholly reliable as they are found not to correspond from year to year. For instance, two years later, or for 1881, the number reported was 44,308; a decrease of 21,000; while the number of bearing trees are 21,481, a decrease of only about 4,000. The number of bushels is not given for that year. For the year 1882 the reports show an increase of 2,000 in number of trees, but a decrease of 1,000 in bearing trees, while the number of bushels is 18,716. Though these discrepances occur, the statistics are probably more nearly correct than any person could estimate; and they form something of a basis for approximation.

The number of farms in the county is 1913. The highest estimate for bearing trees would give each farm 13 trees on an average. These figures are only useful in showing the large number of farms without any trees, and for showing our capabilities, if each farmer would plant 50 good trees.

In comparing Winona, with some other counties, which started in fruit raising several years later, it has not kept up with them, and hardly maintains its early reputation. The counties of Carver, Scott, Dakota and Washington, produced in the year 1880 about 5,000 bushels each: Fillmore & Wright upward of 7,000; Hennepin, 12,560; and Le Sueur, 13,360. Judging from our early success, this county is naturally as well adapted to fruit raising as any of those named except Le Sueur and Carver.

The most marked success has been met in the valleys and upon the ridge land contiguous to the Mississippi river. The opinion is prevalent that the ridge lands are surest and that they are producing the best fruit. There are, however, some fine appearing orchards upon the prairie lands of the west and southwest parts of the county: notably, that of Mr. C. L. Blair, of Saratoga, probably the oldest and largest in that vicinity, though there are several younger orchards in that and the adjoining towns that promise well. These prairie orchards contain but few varieties, the Duchess predominating, and for crabs the Transcendent and Hyslop are best known. Mr. Hohman, located in a small valley a few miles above Minnesota City, planted an orchard of the two last named varieties, intending to manufacture cider and vinegar. His crop this year was about 400 bushels; none of which were manufactured as they readily sold in the Winona market at a fair price.

Of the old stock of seedlings, spoken of in the report of 1873, in the paper by Mr. Ely, only a very few remain, probably not more than 100 in all. A few of these appear sound and healthy, and have borne good crops. President Harris has carefully examined some of the trees and tested the fruit, and pronounces them well worthy of cultivation.

If we are to look for success in apple raising in the direction of our own seedlings, here is a small field for a starting point.

In the orchard of Mr. Whetstone (the old Campbell orchard), where the seedlings have died, their places have been filled with Duchess, Haas, Ben Davis, Utter's Red, Fameuse and Wealthy, and some other varieties, many of which have done well. Last year's crop was a good one. The crop this year was small and the quality not as good as usual.

Mr. Samuel Bates, of this town, was quite successful this year as well as last. He numbers twenty-five varieties, having some promising seedlings of his own. His largest yield this year was of the Duchess. While the old seedling trees were prosperous, Rollingstone valley could show several fine appearing orchards, but now, taking out those of Mr. Bates, Mr. Bryan, and Mr. Whetstone, there are few left deserving of special mention.

In the town of Winona, the old orchards of Mr. George Clark and Mr. Hardwick are still in fair condition, Mr. Clark having secured several premiums at the late State Fair for character and variety of fruit. Mr. Knopp, of the same town, has the most acres (about twenty), set with apple trees and also the most ground in small fruit of any one in the county. He is regarded as a very careful and successful cultivator, having grown much the largest amount of fruit of any one in the vicinity.

The orchards of Mr. Buck and Mr. Rowell continue to produce fine fruit. All the last named being located in the valley contiguous to the river.

The town of Homer produces a larger amount of fruit than any other of the county, a large proportion of which is grown upon the ridges or high lands. Their fruit does not come into market so early as that from the valleys, *but there is no doubt as to its superior keeping qualities.*

But with all there is raised here, the market has at no time been overstocked, and probably an equal or greater amount of fruit from other states has been brought in for sale.

This fact of itself should be an inducement to plant more trees. I am aware of the discouragement one meets, when a single winter will destroy the hopes and labor of years, but we have been successful, and we may be again if we try. If we were to judge of the capacity of this county for producing corn by this year's experience, we might hesitate to plant.

The tendency has been for a few years back to increase the area of small fruits, rather than apples, but there is a growing feeling of greater security, as home nurseries are more generally patronized, and more care taken in the selection of hardy kinds. The superior advantages of home grown trees have become so well known that it is doubtful if glib tongued Dayton, Ohio, or iron clad northern Canada, can again take eight thousand dollars out of this county for nursery stock of no value.

CONDITIONS OF PROFITABLE FRUIT CULTURE IN MINNESOTA.

[Read before the Mississippi Valley Horticultural Society, Kansas City, Mo. January 23, 1884.]

BY OLIVER GIBBS, JR., OF LAKE CITY.

APPLES.

The first condition is that the grower possess a courage that does not quail upon the brink of any earthly woe.

The second is that he love his trees.

The third, that he study his subject thoroughly to learn all the known laws of adaptation.

The fourth, that he select for his main planting only the few hardiest; and

The fifth, that he keep out a liberal line of experiments, according to his means, and be ready to branch out in good time.

In regard to the first condition : No other state has been such a slaughter ground of apple trees, as Minnesota. Nearly every farm that was opened from 1850 to 1860, when all the southern and central sections were settled up, has had a succession of orchard funerals. First, eastern and southern grown trees, next western trees, then Canada trees, then home grown seedlings, and lastly the crabs ; all are gone, of these old plantings, but the Duchess of Oldenburg and some of the crabs in general, and, in particular, here and there a survivor from some other sort that is entirely unable to give any account of itself.

Many of these lost trees lived to bear fruit and give promise of long life and profit. One farmer in my neighborhood, from a small orchard of two or three hundred trees, had five hundred bushels of choice apples, and was peddling them around town from his wagon, like potatoes. The winter of 1872-3 froze up dry. In the spring following, his Plumb Ciders, his Fameuse, his Saxtons, his Jonathans, his Golden Russets, his Talman Sweets, and all that ilk, had not a live root remaining, although potatoes left undug in the fall in ground adjoining, lay through under the deep snow-drifts, and came out perfect in the spring. One may think he knows the reason of all these failures and how to avoid them in the future; but let him be ever so well posted, when he comes to open his purse for a new purchase, and contemplate the labor, the use of his ground and the possible chances of another failure, here is where he needs the courage, a courage like that of Peter M. Gideon, originator of the Wealthy apple, who, for twenty years, went ragged in the battle for apples, through "frosts and fasts, hard lodging and thin weeds," but said all the while, "I will grow apples or leave the state; and I won't leave the state!"

Love for trees is perhaps more necessary to success in severe climates than it is in mild ones. Nothing so well keeps up an interest and a watchful care. Trees need more care in Minnesota than in Missouri, though they get none too much of it anywhere. It must be a love akin to that of parents for their children, of a lover for his mistress, a husband for his wife, of friend for friend—a love for their society, for their beauty, their protection from all danger, their help in time of trouble—an enjoyment of their budding and blossoming time, their growth, their fruitage, until and through the autumn when they hang out their crimson, russet and golden banners, vying with all the lovely colors of the wooded hills, and onward to shield them from harm during the white-robed period of their winter's rest. A man who will bark a tree in cultivating, if he can avoid it, or who having done it, will not hasten to bind up the wound as he would upon the limb or body of a friend, is not fit to grow apples in Minnesota. If he love not his trees, he is liable to put it off, "time is too valuable, something else I can do will pay better." Pay! a man must feel that nothing else pays so well as to keep himself and his associates out of trouble, and he must have that feeling for his trees. He must feel hurt when they suffer, and guilty when he neglects them. Nothing but love for his trees will give him this feeling. "I would like to look through your orchard," I said to a German farmer several years ago, as I was driving by his house. I had just passed his orchard and noted the clean ground, the smooth healthy look of the trees, their general thrifty and well kept expression. "Come in, I will show you." "How nicely your orchard looks," I said, as he was pointing out the different sorts and telling me their names. "Oh, yes," he replied; "*I love my trees!*" The words were few, but such as they were, they gave me, with the man's own expression of countenance and another glance of mine, up and down the rows of his pets, a good long lesson that will never be forgotten.

Adaptation: This is too great a question to discuss in this paper. There is first, and foremost, climatic adaptation, and this is something that seems to require centuries for its growth. That we must look beyond our own country for present success in selections of races adapted here, is evident from the fact that nowhere else in America, where apples have been grown, is there any such climate in reference to summer and winter temperatures, dryness of air, and the peculiarities of rainfall, all taken together. That we can find this adaptation in some of the older countries abroad and transplant it here, is indicated by the further fact that all the sorts now growing and showing adaptation to Minnesota climate, are traceable to an origin in those countries where there are similar climatic conditions. We have the history of the Duchess of Oldenburg. This variety was obtained by Thomas Andrew Knight, President of the London Horticultural Society, towards the close of the last century, from Simbirsk, Russia, with forty other sorts, sent him by the British engineers who were employed by the Russian Government in the improvement of navigation on the Volga. It afterwards went to France, there they dropped its Russian name of Borovinka, and called it by its present name, and from thence, it came to Canada and thence down the Atlantic Coast and across the river St. Lawrence, and everywhere over North America. It never attracted any pre-eminent attention over many other sorts until it came into those parts where its Russian adaptation to extreme cold, extreme heat, and extreme aridity of air and dry soil, singled it out as the one only reliable variety. Knight made many crosses with his Russian apple trees. They too have gone over the western world. When we see a negro, we know he is from Africa, wherever he was *born*, as we call one of the later processes in individual life; when we see a mulatto, we recognize his African blood, and so it is with Russian trees. The expert student sees their blood in form of tree and branches, in buds, in blossoms, in leaves and fruit, and their crosses can never be hidden till they fade down by division and by prepotencey of mingling sorts beyond the reach of the senses to distinguish them. In fact we have found out almost enough already to declare whenever we hear of a previously unknown sort having done well through a period of seven or eight years, without seeing it, "It is a Russian." Our Minnesota Wealthy, now celebrated as a profitable apple for the North, passes, by the tests of botanical science, into the Russian category, and acknowledges thence its adaptation. Second, there is adaptation to high lands and adaptation to low lands—to sandy soils and to clay soils. There are trees that have a general adaptation, and others with special adaptation. While the Dutchess is general and the Wealthy nearly as much so—if a farmer have a valley location, sandy or where the water comes near the surface, let him plant the Wolf River, a variety whose parent tree now thirty-two years old in Waupaca county, Wisconsin, stands where its roots touch the waters of the river, whence it takes its name, and whose progeny scattered well throughout the West, show, as I am informed by J, C. Plumb, of Milton, the same adaptation to low, sandy or wet soils. A large State like Minnesota has variable climates and soils. There are adaptations for all, that must be studied. Russia, as said by Prof. Budd, is a great country. It has its counterparts probably for all the climates and soils of our American apple belt. It not enough to say *Russian*. We must know from what part of Russia. It is not enough to say Minnesota, We must know what part of Minnesota. Is it where the dry cold arctic winds sweep up the valley of the Red River of the north ? Is it where the moist winds from the Gulf of Mexico, or the St. Lawrence and the great lakes, the hot air of the southwestern plains, or the mild breezes of the Pacific, fugitives from the Chinook, squeezed of their vapors in passing over the steeps or the forests of the Rocky Mountains, mostly or in part prevail? Is it on the wide prairie sweeps, the bluff lands with their air drainage, above as well as below ground, the timber and prairie openings, or the dense forest regions of the big woods? All these are questions which must be studied in order to make fruit raising profitable in Minnesota.

A man must not begrudge a dollar for his state horticultural society, or two dollars for the Mississippi Valley Society, to secure him its reports to read on all the vital points in the business, and pay twenty dollars for a worthless bill of trees that the books would have warned him of.

Selection of a few only of the hardiest for general orcharding is important for many reasons, but these reasons are so open and palpable that it almost seems a waste of time to mention them. A man must go for sure things to some or to the main extent to keep his courage up. Everlasting failure or liability to it will beat the toughest orchard crank in time, as it does the Keeley motor or the inventor of perpetual motion. The man in Wisconsin who said several years ago, before the Wealthy was found, "If I were to set out a new orchard of one hundred trees, I would plant ninety-nine Duchess and one Duchess of Oldenburg," was not far from right.

That would be sure to be profitable. The only orchardists in Minnesota to-day who are making any money on apples are the ones who did about the same thing, or who divided their planting between the Duchess and the Wealthy. There are many other sorts coming into favorable notice, seedlings and imported trees, that promise to show equal, and in some respects superior merit. It even looks as though we are on the eve of a sudden extension of our list into a large variety of apples, and that we shall add to the acknowledged beauty and high quality of the apples we have, the merit of long keeping in the new sorts, and be able to dispute the markets of the world with New England, New York, Michigan and Missouri; but on the experimental list let them stand, with reasonable hospitality, for further acquaintance, before putting them into orchards on a large scale, by men of moderate means and without expert knowledge in making selections.

PEARS.

The pear for our adaptation we have yet to find. Our hope is in Charles Gibb and Prof. Budd.

THE CHERRY.

The cherry went out of general view when the winter of 1872–3 killed our Early Richmonds. The Germans of Carver county, latitude about 45°, have had the Ostheim for over twenty years, unknown to the Minnesota Horticultural Society till now. They say it is hardy enough there, and is adapted to the climate, that it blossoms late in the spring, bears heavy in favorable seasons and is a large, good, dark-colored cherry. They propagate it only by root sprouts. Mr. Charles Ludluff, of Carver, who obtained the first trees from Germany, says that if grafted it must *not* be on sour cherry stocks. Whether it will be hardy west of the big woods or in the northern part of the State we do not know. We want to try for the severest tests the Russian Vladimirs, and shall do it as soon as we can get them, by importation, or from that "nest of spicery," the Iowa Agricultural College farm at Ames.

PLUM CULTURE.

Plum culture we know nothing of in Minnesota except as to the Illinois, Iowa, and Wisconsin natives, like the Forest Garden, the Weaver, the De Soto, and many nice sorts selected from our native Minnesota groves. But the growing of these native sorts I have mentioned is successful and profitable. They are of fair quality for eating out of hand and good for cooking. They are large, handsome and sell well in market. The Forest Garden is earliest but will not bear much handling or transportation, unless with extreme care, it is so tender in skin and pulp. The Weaver and De Soto are firm. These two resist the Little Turk, and for some reason he does not seem to get hold of the Forest Garden where I have seen it grown. Perhaps he may under other conditions. These varieties are all perfectly hardy. Opinions differ, but I consider the De Soto the most reliable for a crop and the most profitable. There are others highly recommended, but I am not acquainted with them.

SMALL FRUITS.

As to small fruits little need be said. From the currant to the grape they are nearly all at home in Minnesota, only that some of them entail more labor on the grower in their needs for winter protection. Aside from this, the manual of small fruit culture is the same for Minnesota as elsewhere in the north. We think our climate, or our climate and soil together, produces better outdoor market grapes than can be grown in the East or further down the Mississippi valley. We see of no other growing as handsome Concords or as good Delawares. The river bluff region at St. Paul and below, and the lands around Lake Minnetonka at present produce the finest. Whether our success in grapes is due to soil or air, or to our short, hot summers, or all combined, I cannot say. Our growers have lost but one crop of grapes by frost in twenty years.

AWARDS TO MINNESOTA IN 1883.

On the 13th of September last, at Philadelphia, the American Pomological Society awarded to Minnesota the Wilder silver medal on its collection of apples and grapes, there being but fbur medals awarded on the entire exhibition of fruits. On the same day the Pennsylvania Horticultural Society, having all the exhibits of both societies before them, awarded us the second premium on best twenty varieties of grapes in cut bunches.

AMERICAN POMOLOGICAL SOCIETY IN 1885.

Members of the Mississippi Valley Horticultural Society from other states: We hope to meet you in Michigan in 1885. We acknowledge your supremacy in oranges, peaches, pears and plums; in some states in the extension of the number of varieties of profitable apples; in others in the production of winter apples; but when this venerable umpire and patron comes to consider the greatest beauty and quality combined of which the apple is capable, and the character of our outdoor grapes, we may claim the medal again. But the rivalry shall be generous as it is in all strictly horticultural exhibitions; and whoever wins, the defeated party shall lead the other out for the applause at the footlights before the curtain, and help bestow the wreath of bays.

[From the banquet at the Green Bay Meeting of the Wisconsin Horticultural Society, in reply to the Following Toast:]

"DOES THE FLOWER GARDEN PAY?"

My wife, who keeps the statistics in our family, notified me last fall that the clock which tells the years for us had struck fifty-one for the ostensible head of the establishment; and now, as I am on the shady side of life, it is realized more clearly than ever before, that there are some employments for us in this world that pay tolerably well, and yet whose remuneration may not be accompanied by the crinkle of greenbacks or the clink of specie: and of all the branches of horticulture that pay us in the pleasures they afford, and in the good they enable us to do, I take the affirmative on the proposition that the flower garden rather has the lead.

You who do not grow flowers, think you love and admire them. Probably you do; I guess everybody loves flowers. But you can never begin to imagine how much pleasure they can confer till you come to have a flower garden, and tend it with your own hands.

The flower garden pays especially well in its influence upon children in the family. Whatever fixes the attention or engages the affections of the young, either elevates or debases them. When they take to flowers, who ever thought of a bad influence from it? Flowers are as good medicine for the mind as fruits are wholesome for the body.

My wife and I have brought up a family of girls and a single boy. I do not speak here to advertise the girls for the matrimonial market; for all but one are gone, and we do not want any one to come after her. But I was thinking when the toast was given me, how much good the rose-garden at our house has done the girls and their associates. How convenient it has been when the young gentlemen from other wigwams were hanging around, and the old folks in the way, for the girls to help the cads out of their embarassment by saying, "come out and see the roses, Jo," or words to that effect ; and as my wife and I have sat on the front porch, and watched the evening shadows chase the retreating sunshine up the eastward bluffs, across the lake, we have thought that there were lessons in horticulture being taught the boys out there among the roses what would be of some use to them by and by when their wives want a man to handle the old briars, or dig in the rose-garden, or foot the bills for a reasonable supply of seeds or plants for house or garden. Who could refuse, remembering the flower garden of young love's dream. We may have thought, too, that the girl who gives a young gentleman such lessons in horticulture, and who pins a flower upon his coat, or places a boquet in his hands, as she bids him good night over the front gate, does her part to make a husband for somebody who will be more of the lover in married life for it, and who will find flowers in his home that will be more attractive for his evening or other leisure hours than society at the clubs or the cross-roads' groceries, and who will treat his wife maybe as " the most splendid flower" of all.

I remarked that we have but one boy in the family. At present he is not much of a horticulturist. If he follows the plow with any pleasure it is when it is returning from the field, or when some neighbor has borrowed it and is taking it off the premises, or when it is badly crippled and going to the blacksmith shop. He does not feel the need of exercise in the garden. He loveth not the hoe, and the dibble is an abomination. Also the spade. And he would actually rather go without his strawberries than to pick them for himself. Yet with all this there is hope for even him. He may be eminent in horticulture some day; for after his mother has bossed the job, and I have done the work to grow a few choice free blooming roses, we notice now that when he comes home from the shop, and fixes himself up for his evening walk, he too goes round the corner of the house to the flower garden and cuts a bloom of something for his coat collar and liberally helps himself to enough of the pink moss roses to stock a graded school graduation; and when his mother watches him crossing the lawn towards the city, she knows those flowers are not going to the beer saloon or the billiard hall, and she knows too that they will carry a silent message to some other mother that says, we can trust our children when they wear the badge or carry the tokens, or study together the lessons of the flowers.

How often a timely gift of flowers pays us for our labor in growing them ! How delicately can we confer a favor or repay an obligation in this way, and how many fine lessons can be impressed by flowers ! One day last summer I saw a railroad conductor, a young man, new on the road, interfere to protect a passenger from the insolence of a baggage-master. The next trip he made through our town, he found awaiting him at the station the best boquet the place afforded, indorsed " with the compliments of Lake City for politeness to passengers." When that boquet went home to his mother, sister, wife or sweetheart—which of course it did—while the givers reflected how it paid them to grow flowers, I dare say the conductor was thinking and would never forget that it paid to exercise common sense and politeness in the management of a railroad train.

The flower garden pays in the aid it gives us in the regulation of our lives. There are no creeds here to fetter the mind—no conventionalities to hinder our study into the laws of life. When we study the organs and the growth of plants and flowers we are led directly and irresistibly to apply the knowledge we gain by analogy to ourselves as only higher forms of life; and seeing one great law of improvement or degradation governing all, we learn to reverence the provisions that nature makes for man to work out his own relief, and to understand that there is no escape from the dreadful consequences of inattention to or violation of natural law, either for ourselves or our posterity.

We now understand as pomologists that the fundamental condition of success is a knowledge of fruit blossoms. Let us note and give due credit to the fact that all or nearly all our advancement here, has had its beginning in the work of florists in the study of the nature and uses of the organs of flowers; and here we find that the flower garden has paid us as the greatest promoter of our art.

G.

ACKNOWLEDGMENT TO PROF. BEAL.

The Secretary is under obligations to Prof. Wm. J. Beal, Lansing, Michigan, Secretary of the American Pomological Society, for advance sheets of his report of proceedings of the meeting of that society held in Philadelphia last September. This makes it possible to publish in our report of 1884, many useful extracts that ordinarily could only appear a year later.

NOTES AND EXTRACTS

FROM THE AMERICAN POMOLOGICAL REPORT 19TH BIENNIAL MEETING, 1883.

IMPROVEMENT OF FRUIT BY SEED PLANTING.

President Wilder. "Thus would I preach while life shall last; Plant the most mature and perfect seeds, of the most hardy, vigorous and valuable varieties of fruits, and as a shorter process, insuring more certain and happy results, cross and hybridize our finest kinds, for still greater excellence."

QUALITY AND HARDINESS IN SEEDLINGS.

Dr. E. Lewis Sturtevant, Geneva, N. Y. To improve the *quality* of fruit, select seed from fruit containing less seed than the average for its kind. Cross-fertilize small or few-seeding varieties with pollen from varieties of the same or similar habit as to seed, and from the produce select the few seeded specimens for continuous plantings. Continue this kind of selections through succeeding generations of seedlings. These suggestions of Dr. Sturtevant are based on facts in his experiments at the New York farm at Geneva, indicating that quality in fruit improves by the care of man in fruit trees and plants in proportion to the decrease of seeds.

A row of strawberry plants raised from seed that were showed me by Dr. Sturtevant, exhibited facts in this direction. Taking the same variety of berries—if I remember rightly, the Wilson, he set for the first hill a seedling plant raised from a berry containing the largest number of perfect seeds; the next hill, the next largest, the next, the next, and so on till the last hill, which was from the fewest seeded berry. On fruiting the row, this last hill gave the best flavored berries of all. This was in 1883. Further results from the same row, as to productiveness and quality, vigor and habits of the plants, comparatively, will be interesting.

The reason suggested by Dr. Sturtevant for this apparent rule of reproduction, is that nature, under the care of man, is relieved in part from the necessity of exerting her powers to protect and preserve the plant in the natural war of races and individuals, wherein only the fittest survive; and the reproductive instinct lessening or sleeping under this case, the improvement of conditions in cultivation, goes to the pulp or receptacle of the seeds and enhances the quality. This is not the Doctor's language, but "for short" is believed to be his idea.

To improve the *hardiness*, therefore, the rule of selection of seeds would be the reverse; that is, take the many or plump seeded kinds, and so on from generation to generation. G.

ENCOURAGEMENT OF BETTER QUALITY IN FRUITS—POMOLOGY IN PUBLIC SCHOOLS.

President T. T. Lyon, South Haven, Mich. Trees of varieties of fruit of high quality, being usually poor growers, should be catalogued by nurserymen at higher prices.

And while legislators are moving in the effort to provide for the instruction of children in our common schools respecting the injurious effects of alcoholic beverages upon the human system, may it not be altogether wise and proper that we, sustained as we will be by the deductions of the medical fraternity, present as nature's favorite preventive, if not her *antidote* for this sovereign evil, the free and abundant use of ripe fruits, and to urge at the same time as a most effective means of accomplishing this object, the teaching in our common schools, as well as in higher institutions of learning, the fundamental principles of pomology, including the origination, care and management of trees and plants.

STRAWBERRIES.

Under this head are selected only the points in discussion thought to be of most practical value to Minnesota. The facts given in respect to influence of pollen are given in another article.

Black Defiance. James Wood, of New York. It is a superb family berry, but is rather difficult to grow. This does not deter the true amateur, when the highest quality rewards his efforts.

E. Moody, Lockport, N. Y. It is good with good care.

Cumberland Triumph. E. H. Bissell, of Virginia. It is steadily and rapidly growing in favor. The plant is vigorous, productive and profitable to the grower.

G. W. Campbell, of Ohio. Foliage healthy, bears well, and fruit is of good form and handsome in color and averages large.

J. B. Rogers, of New Jersey. With me it is good to fertilize the flowers of the Manchester.

T. T. Lyon, of Michigan. It lacks firmness, [plant some firm staminate near it to correct this deficiency] but is superior for amateur purposes.

E. Williams, of New Jersey. It is one of the best for family use.

S. Johnson of Indiana. Two stars for Indiana.

Great American. On a motion to strike it off, E Williams of New Jersey said no berry had borne so well as this one in certain locations.

C. M. Augur, of Connecticut. I saw in June last at, Hilton, New Jersey, one acre and eight and a half rods, that yielded a return of $1803, or fourteen cents per quart gross. This I think the largest on record. A berry capable of that ought not to be taken off the list. It needs heavy soil, thorough manuring, and plants set in single rows, with good cultivation. Neglected, on a light soil, it is of little value.

J. B. Rogers, of New Jersey. Averages thirty-six to the quart. The ground must be firm, and not disturbed deeply, while the plants should be renewed yearly.

Jersey Queen. Contradictory reports of this berry, but the weight of testimony was in its favor for heavy soils and with good fertilizing from staminate sorts.

P. M. Augur spoke of samples weighing two and three-fourths ounces each.

A. J. Caywood of New York. It has beaten the Manchester, Seneca Queen and some thirty other varieties which we fruited. Although the Seneca and Manchester are heavy bearers, this trio, with Seneca Queen to fertilize the other two, are in my opinion the best of the new ones at present.

Miner's Great Prolific. Strongly recommended by T. T, Lyon, of Michigan, S. Johnson of Indiana, R. H. Haines of New Jersey, J. H. Bourne of Rhode Island, and J. H. Hale of Connecticut.

Seneca Queen. P. M. Augur. Good in Connecticut.

T. T. Lyon, of Michigan. One of the most beautiful and productive of dessert sorts, but lacks firmness for the market. [Give it a firm staminate companion for a fertilizer.]

Sharpless. Indorsed very strongly, perhaps more so than any other berry spoken of at this meeting. Testimony unanimous in its favor, generally placing it at the head of the list.

Donner's Prolific. Restored to the list and starred for Minnesota on statement of its value there for sandy soils.

Manchester. J. H. Hale, of Connecticut. Has now fruited with us three years, and stands without a rival for productiveness, uniform large size, and perfect form of fruit; pale, scarlet color; moderately firm and good quality; ripens medium to late. In planting for profit next season, 90 per cent of our planting will be of the Manchester.

For other remarks about the Manchester strawberry, see article on "Immediate Influence of Pollen."

James Vick. C. A. Green, of New York. This has proved the most prolific of all with us, and appears to be blight proof.

Mr. Bassett, of New Jersey. The foliage resembles the Cumberland Triumph, and it is perfectly healthy.

Dr. S. Hape, of Georgia. I have given it a severe test at Atlanta, and it is very promising.

W. C. Strong, of Massachusetts. Its growth is all that could be desired.

Dr. F. M. Hexamer, of New York. The berries are similar in general appearance to Capt. Jack, but larger, of better quality, handsome and very firm, suitable for shipping great distances. Its yield in number of berries is simply enormous; and if all that set are allowed to remain, many will naturally be small; but if a judicious system of thinning out were practiced, the main crop would be of good marketable size.

G. W. Campbell, of Ohio. Not fruited with me yet, but the vigor of the plant and the health of foliage is very satisfactory.

J. H. Hale, of Connecticut. The foliage is strong and heavy. The berries rather small, but uniform; quality good; ships well.

E. Williams, of New Jersey. I regard it as a healthy, promising sort.

J. S. Collins, of New Jersey. Heavy foliage; productive; berries firm, but not of large size.

Oliver Gibbs, Jr., of Minnesota. Not fruited yet in our State, but is promising well. F. G. Gould, of Excelsior, one of our best judges of plants, predicts that this is one of the new sorts that have come to stay.

George Balderston, of Maryland. It is a vigorous and healthy grower, but what surprised me was the great quantity of roots each plant possesses—more than on any other variety I ever handled. I have not tested the fruit.

P. M. Augur, of Connecticut. Whoever plants it must understand that good feeding must be given any variety that is as prolific as the James Vick.

Atlantic. Dr. F. M. Hexamer, of New York, spoke of extraordinary crops of this new variety being grown on the sands of New Jersey.

Hart's Minnesota. J. H. Hale said of this that is very fair, of a glossy color, early,—a good amateur berry.

Mt. Vernon. E. Satterthwait, of Pennsylvania. I fruited this year for the first time about two acres of this variety, and it proved to be the most profitable of about a dozen of the best sorts, including the Sharpless. It is late, good size, the right color for market, sufficiently firm and very productive.

Oliver Gibbs, Jr., of Minnesota. I have kept careful watch of the new sorts fruiting in Minnesota this year, and this is the only one of them I have cared to add to my list.

P. M. Augur. It is a good fertilizer for other late sorts.

Prof. Beal publishes in the report the following table from the *Rural New Yorker,* showing the preferences of its readers for twenty varieties of strawberries, according to their answers to an inquiry for a statement of their choice:,

Crescent	45	Glendale	10
Wilson	37	Captain Jack	9
Downing	30	Windsor Chief	7
Sharpless	27	Green Prolific	7
Manchester	23	Duchess	5
Kentucky	23	Jersey Queen	5
Cumberland	22	Downer's Prolific	4
Bidwell	15	James Vick	4
Miner's Prolific	14	Jucunda	3
Mt. Vernon	12	Crystal City	3

CURRANTS.

Fay's Prolific. J. T. Lovett, of Little Silver, New Jersey. This is a signal success in our State, fulfilling well the claims made for it.

C. A. Green, of Rochester, N. Y. It is vigorous and productive, and appears to be an improvement over any variety we have.

J. B. Rogers, of New Jersey. From the limited experience had with this variety, the indications are that it is the most prolific of all the currants. It will be planted extensively the coming season.

J. S. Collins, of New Jersey. It is a strong, healthy grower, productive, very large and of good quality.

Lee's Prolific. J. W. Manning, of Reading, Mass. It is a strong grower. The wood as well as the fruit possesses a very high aroma. The berry is large, and the fruit abundant. It is a new black sort, which may excel the Black Naples.

GOOSEBERRIES.

Houghton and *Mountain* were recommended by several speakers, S. Johnson, of Irvington, Indiana, speaking of the Mountain as a high bush variety.

Orange. This was recommended by H. M. Engle, of Pennsylvania, as a good early gooseberry.

Smith's Improved. J. W. Manning. We named it Smith's Seedling when we introduced it in 1864. Dr. Smith, of Windsor, Vermont, raised it from the seed of the Houghton. H. E. Hooker, of Rochester, New York, we suppose, changed its name to Smith's Improved. It is one of the best gooseberries in cultivation. No one comes before the Massachusetts Horticultural Society so uniformly fine as this.

Foreign Gooseberries. Objection being made to allowing any of these sorts on the list on account of their tendency to mildew —

Thomas Meehan, of Philadelphia, said they were valuable with skillful treatment in certain places.

J. W. Manning. Foreign gooseberries are not to be discarded. They require special treatment. I have seen fine crops growing on the place of A. Hammond, at Seneca, New York. He attended to his plants every day, cutting out old wood, letting in the sunlight, and mulching with green grass. I once saw a successful plantation in Jersey City. They need much care and the right treatment to prevent attacks of mildew.

RASPBERRIES.

Clark. A. J. Caywood, of New York. One of the best family berries we have.

Cuthbert. Vice-President Berckmans, of Georgia. The introduction of the Cuthbert has been a good thing for Georgia. It will keep several days after shipment, and then bring a high price in market. Also strongly recommended as the best late raspberry for the market and for the table by E. H. Bissell, J. H. Hale, H. M. Engle, J. S. Collins and W. C. Strong.

Herstine. W. C. Strong. Excellent for family use.

Gregg. S. Johnson, of Indiana. There is but one voice in Indiana in regard to the Gregg. As a black-cap it is about as near perfection as is likely to be reached.

W. C. Strong. The most desirable of the blackcaps.

J. H. Hale. The largest black-cap we have, ripening too late to command a high price in market; yet it is very valuable for family use.

J. T. Lovett. Requires a heavy soil and high culture; then large, productive and very fine.

Purple Cane. Thomas Meehan of Philadelphia. An old and strong hardy sort. Should be retained to raise seedlings, if for no other purpose.

Reliance. A great improvement over its parent the Philadelphia, which it resembles in color. Next to Cuthbert. The most reliable sort we have for family use.

Souhegan. J. H. Hale, of South Glastonberry, Connecticut. We have tested the Souhegan now for four years, and find it to ripen from four to six days earlier than the Doolittle. The plant is vigorous and very prolific, fruit jet black, rich and sweet; very profitable for market, and one of the best for family use.

Robert Manning. Two stars for Massachusetts.

J. T. Lovett, of Little Silver New Jersey. I consider it of great excellence and value, ripening as it does very early. It is enormously productive, free from bloom, and by long odds the best early black raspberry we have. With this and the Gregg for late we have little use for any other black cap, either for table use or for the market.

Hansell. J. S. Collins. It is a very good, new, early berry for shipment.

•J. H. Hale. It stands the drouth and the heat well; a very promising early sort.

C. A. Green. It is a moderate grower, rather firm, of good color and fair size.

Howard A. Chase, of Philadelphia. The Hansell is a chance seedling that has been fruited by the originators, in Burlington county, New Jersey, for six or seven years. They have tested it beside the Brandywine, and it has proved to be hardier, more productive, as good a shipper, of better quality, and from a week to ten days earlier than that berry. It is undoubtedly the earliest ripening red raspberry now grown. The originators have increased their plantation as rapidly as they could produce the plants, now having about ten acres in fruiting, and have entirely ceased planting the Brandywine.

Marlboro. C. A. Green, of New York. It is large, bright red, firm, of good quality, very early and a vigorous grower, evidently a heavy yielder.

J. H. Hale, of Connecticut. It is a strong, vigorous plant, fruit of largest size, bright color and very firm. It ripens extremely early. It is much like Brandywine in flavor, gives promise of being the early market berry of the near future.

T. T. Lyon, of Michigan. I saw the plant in New Jersey. It is certainly a very vigorous variety.

J. S. Collins, of New Jersey. The canes are growing very healthy and strong in New Jersey.

J. H. Hale, of Connecticut. The Marlboro is a large and fine early sort.

Reader. T. T. Lyon, of Michigan. It is good in West Michigan for Chicago market. It is of fine quality and bright color.

Shaffer's Colossal. W. C. Strong. The black caps are little cultivated and not wanted in our markets. This one is remarkably vigorous, fruit large, dull red and of inferior quality. It may be valuable for canning—bottling, I should say, for such fruit should always be put in glass jars.

T. T. Lyon. It is the strongest tip-rooting variety I know. It ripens its fruit in succession, and often produces a fine crop on the new canes, from tips of the previous spring planting. Fruit not of an acceptable color for market. I should think best to omit the word "Colossal" and call it "Shaffer."

J. Saul, of District of Columbia. It is one of the best of its class; it is not fit for market, however.

Dr. S. Hape, of Georgia, finds they sell readily in market and are considered very valuable generally; a little sour, but excellent with plenty of sugar; superior for canning; very productive.

J. H. Hale. An improvement on the Catawissa and New Rochelle. Fruit of largest size, but of dull red color that will not sell well in market; valuable for canning.

Parker Earle, of Illinois. I can say this for the Shaffer, that the fruit is of excellent quality for the table, for all people preferring an acid raspberry. I find that at my own table it is taken in preference to the Turner, which I esteem the richest and best of all raspberries. For canning it has very great merit; and while its wretched purple color will forever debar it from all markets where whimsical prejudices about color and total disregard of eating quality seem to determine all values, yet the Shaffer must be regarded as a very valuable addition to our list of raspberries.

G. W. Campbell agrees with Mr. Earle.

C. A. Green. It will yield twice as much as any other red raspberry that we have seen; fruit of the largest size, color dark purple, the best for canning, and meets with ready sale in ordinary markets; not suitable for fancy markets. The most vigorous of all in growth.

J. T. Lovett. The strongest growing and the most prolific of any raspberry that I have yet grown. The fruit is of colossal size, in truth as well as in name, and although rather tart to suit most tastes, yet it is sprightly, and to my liking. Its color is so dull and unattractive that it does not meet with a ready sale in market. I have found it the best of all berries for canning.

Prof. Beal also publishes the votes of correspondents of the *Rural New Yorker* on raspberries, as follows:.

Cuthbert	32	Gregg	32
Turner	20	Mammoth Cluster	13
Doolittle	11	Souhegan	10
Tyler	7	Caroline	7
Philadelphia	5	Hansell	4
Clark	4	Davison's Thornless	4
Highland Hardy	3	Shaffer	3
Brandywine	3	Early Prolific	3
Lost Rubies	2	Ohio Black Cap	2
Montclair	1	New Rochelle	1

BLACKBERRIES.

Nothing in the discussions about blackberries of apparent value to Minnesota, except what has been already stated elsewhere in the Minnesota report as to the Snyder and Stone's Hardy.

GRAPES.

There was a longer and more animated discussion on grapes than on any other class of fruits ; in fact, the grape fever seemed to run high among the representatives of most all sections of the country Many new sorts were exhibited. Among these was the Jefferson, resembling the Delaware, but the bunch more shouldered and the grapes larger. It is rather late ; said to be a seedling of Concord, fertilized by Iona. Quality excellent. Worthy of trial in Minnesota. If it will ripen here it may prove of value.

T. S. Hubbard, of Fredonia, New York, J. Saul, of Washington, Dr. S. Hape, of Georgia, H. M. Engle, of Pennsylvania, W. C. Strong, of Massachusetts, and G. W. Campbell, of Ohio, all spoke well of it.

Lady. E. H. Bissell. It has fruited this year at Richmond. As compared with Concord, it has been as vigorous and productive, Both foliage and fruit have been free from disease or blemish. A promising variety.

J. Saul. I consider it one of the very best early grapes. It is rich in color, with a delicious flavor.

J. H. Hale. It is a valuable early sort for family use.

J. B. Rogers. In New Jersey it makes four clusters, many small berries, and is very thin in the bunch.

E. Williams. It is liable to rot.

Lady Washington. S. Hape. It is quite successful in Georgia.

J. Saul. It is an excellent grape and promises well in the District of Columbia.

Moore's Early. R. H. Haines. Give it one star for New Jersey.

J. T. Lovett, of New Jersey. It is equal to Concord in all respects, unless it be that it is not so productive—it indicating a tendency in that direction with me. I think it rather better in quality, and it ripens nearly two weeks in advance of the Concord. Give it two stars.

T. T. Lyon, of Michigan. It is considerably planted in Michigan, and highly esteemed as the most promising very early grape for general planting.

T. S. Hubbard, of New York. It ripens with us only about a week ahead of the Concord, and about with the Champion. Grows only fair clusters, not uniformly as large as Concord, though berries are larger. Quality about the same as Concord.

G. W. Campbell, of Ohio. It is best described as an early Concord, with clusters smaller and berries larger.

Pocklington. The reports on this variety were contradictory, but the weight of evidence was against it, as being ten days later than Concord.

Worden. Vice President Berckmans. It is earlier and better than the Concord in Georgia.

T. T. Lyon, of Michigan. It is becoming more and more popular in Michigan, and deserves one star.

G. W. Campbell. It has not done very well this season, but is generally good and reliable. A week earlier than the Concord, with larger clusters, and rather better flavor. Increasing in favor. I think it should have two stars for Ohio.

John Saul. Give it one star for the District of Columbia.

F. M. Marble, of Massachusetts. Very good with us, ripening when others fail.

J. H. Hale. All things considered, I think this the most reliable black grape we have. Two stars.

J. B. Rogers. Better than the Concord in flavor and size. Rapidly coming into favor. Give it two stars for New Jersey.

T. S. Hubbard. With us it ripens only two or three days before the Concord. Is gaining in popular favor.

Eldorado. J. T. Lovett, of New Jersey. Taking into consideration superior quality of fruit, beauty and excellence of vine, I would place it first among the best of white grapes, either new or old. I fear that its value is not appreciated.

THE PHYLLOXERA.

Wm. Saunders, of Washington. I should like to inquire of cultivators in reference to the injury from this insect.

G. W. Campbell, of Ohio. My vines were troubled with it a good deal a few years ago. Lately the insects have become quite scarce in our locality.

THE MILDEW.

Mr. Saunders. Our native grapes are destroyed by winter frosts because they have been subjected to mildew in summer, and it is only in special localities where all kinds grow well. The most generally cultivated grapes are confessedly not those of the best quality either for table use or for wine. No one would grow very largely of Concord, Ives, Martha, or Hartford Prolific, if they could with equal certainty secure regularly good crops of Ionia, Eumelan, Delaware, Walter, Diana, Catawba, or Brighton. The best grape climates are those where there are least dews, and wherever we find specially favored localities, we will find this partial or total exemption from heavy dews. This has long ago been demonstrated, and new grapes emanating from favored regions will fail to give entire satisfaction when grown in localities less favorably situated, and thus lead to disappointment. This is the reason for so many seemingly conflicting opinions regarding the merits of varieties, and it is unfortunate that these considerations are not better understood and recognized. When a young grape vine loses its foliage by midsummer, and the green shoots remain unmatured till frost, that variety might as well be discarded at once; no known methods of pruning, fertilizing, or care in cultivation will help it. The only known remedy is shelter, arranged so as to arrest radiation of heat from the foliage during nights.

Among the more recently introduced varieties, the Bacchus, Lady, Pocklington, Moore's Early, and Noah will probably succeed well wherever the season is long enough to ripen the fruit. Brighton, Duchess, and Prentiss will require specially favorable localities for their perfection. Thus it is that the best flavored and most desirable varieties are not always the most reliable.

APPLES.

The discussion on apples was mostly confined to varieties of little account in the Northwest. A call being made for a report on the Minnesota collection,

Oliver Gibbs, Jr., of Minnesota said: I can gratify my own constituents, and perhaps add a little to the stock of knowledge here by a few remarks about the three varieties of apples, samples of which I show you here on these plates.

Vice President Berckmans, of Georgia. We shall be very glad to hear about them.

Secretary Beal, of Michigan. Yes, and we want to hear more and more from Minnesota.

Oliver Gibbs, Jr. You all know the Duchess of Oldenburg. It is a universal success in the North, and doing better in the Northwest than anywhere else. You have seen it in the Minnesota collection and admired its beauty.

But here is the Wealthy, a seedling of our own, which is said to be worth a million of dollars to our State, and this I wish to give a little more prominence on your records. The specimens here do not show the beautiful color and finish that belong to the Wealthy as they wanted a few weeks' more growth and sunshine to mature them. When ripe the Wealthy is a bright red, with usually a delicate light blush on one side. You see its size is medium to large, and its shape is just perfect. With us an ill-shaped or ill-looking Wealthy is never seen, and we have already hundreds of bushels in single orchards. These samples were picked from an orchard of

2500 bearing trees of the Wealthy. The texture is tender inside, although the skin is such that it will bear handling, like the Jonathan, and its waxy finish, when ripe, protects it from evaporation from within and penetration of the air from without. The flavor is a slightly sub-acid, with a vinous quality. In fact, it is a better dessert fruit than the Fameuse, and belongs to the digestible class of apples. In the Northwest its season is ordinarily late fall or early winter, although Dr. Hoskins, of Northern Vermont, classes it there as a winter apple with the Baldwin. It stays mellow a long time like the Seek no further, before commencing to decay or lose its quality, but does not have any tendency to wilt. The tree is not quite so hardy as the Duchess, its weakness being a tendency to get injured on the stem while young. This can be overcome by boxing. It ripens up its wood early in the fall. Our coldest and most sudden winters never catch it unprepared, and we can grow it perfectly as far North as the 46th parallel, and how much farther we do not know.

It is a very early, an annual, and an abundant bearer. This variety was originated by Peter M. Gideon, of Excelsior, Hennepin county, Minnesota, at Lake Minnetonka, about twenty years ago. The seed was sent him by Albert Emerson, of Bangor, Maine. Mr. Gideon thinks the seed that of Cherry crab. Professor Budd, of Iowa, however, classes it as a Russian, from the characteristics of leaf and bud, of the Astrachanica form, a straggler in heredity perhaps by way of a cross, from some importation through New Brunswick or Canada to Maine, and thence to Minnesota; as our Duchess was from France to America after Andrew Knight brought it from Simbirsk to England as the Borovinka and let it go over to the French for trial, where a new name was given it. It is a boon to the Northwest, and doubtless has value to the entire North, for so far as tested in several states it appears to be of general adaptation.

The State of Minnesota gives Mr. Gideon a thousand dollars a year and the use of a farm on Lake Minnetonka, to continue experiments in fruit raising in his own way, without interference, asking only that he report once a year to the Board of Regents of the State University.

This other large, smooth apple is the Yellow Transparent, one of the Russians of the Agricultural Department importature. It is of good dessert and cooking quality, season earlier than the Duchess; a reliable and abundant cropper.

Mr. A. G. Tuttle, of Baraboo, Wisconsin, is experimenting largely with the Russians, and says that since he has fruited this he has no further use for the Tetofski. The Yellow Transparent does well so far in Minnesota, and I would recommend it there for general trial, though possibly we may want a hardier Russian for the north part of the State.

This red undersized apple is the best of all the crabs—the Whitney No. 20. It is good for hand eating, and almost as good as the peach for canning, and is pronounced by experts as the best apple to sell to the driers yet known, as it needs no paring, has just the right proportions of acid and sugar and the right texture, and only needs to be cored and cut in two to prepare it for use. The tree is a perfect beauty; stem straight as a gun barrel, top of a peculiar curved upright growth, unlike anything else in our orchard list. When you see a tree of Whitney No. 20, you always recognize it at a glance from the clear individuality of its expression. It was originated by A. R. Whitney, of Franklin Grove, Illinois. Its parentage is unknown to me, but Professor Budd classes it, by its habits of growth and its thick pubescent leaves, with the Russian Astrachanicas. I do not know but that on his theory of adaptation, he will yet prove all of our successful sorts in the Northwest to be of that class.

We have other very interesting varieties of the apple, but as these are the best of the newer ones that have been well and generally tested, I will not take up your time further.

CRAB APPLES.

J. A. Root, of New York. People have just begun to appreciate the different varieties of the Crab. They are rich in flavor, excellent for jelly or pickling, canning, for making apple butter, and, for evaporating, if simply cut once in two and dried, they make a third more pounds of evaporated fruit. They bring double the price of ordinary evaporated chopped apples. The trees are very hardy and prolific. This year the crabs have produced a good, full crop, while all other varieties of apples are very scarce.

Whitney No. 20. J. W. Manning of Massachusetts. This is a very handsome grower; a most desirable variety, and a substitute for all others in its season.

PARAGRAPHS FROM C. A. GREEN.

UNCERTAINTIES.

The astonishing quantity of fruit a community, whether rich or poor, can be educated to buy and eat.

Whether new varieties of fruit approaching the ideal in one direction tend to weakness or defects in another.

Whether the fruit or the seed is the primary object of nature. The protection, development, and dissemination of the seeds would appear to be the primary object, the edible qualities aiding in the distribution of the seeds.

The cause of occasional late strawberry blossoms being pistillate on hermaphrodite plants. Where strawberries do not perfect all their fruit this may often be found to be the cause.

The cause of the occasional destruction of fruit germs after blossoming, in the apple and pear.

Why seedlings are apt to succeed best where they originate. We might suppose the survival of the fittest a cause. If one had sown eastern apple seed in Dakota and one survived, it might be expected to be the hardiest that germinated. If we had sown apple seed produced from Dakota trees we should have hoped to have been more successful, expecting that the Dakota grown seed would inherit and tend to perpetuate characteristics produced by their parent's struggling with the great severity of the climate. Professor Beal has shown how the vital forces of trees are thrown to the points bearing the greatest strain or hardship, citing the strength of branches that buffet every wind. This accidental characteristic might be utilized in producing hardier varieties.

CERTAINTIES.

That our occupation is healthful not only to us who pursue it, but in its effects on those who consume our product. Fruit growers do more to bankrupt the grave-digger than doctors.

If we find birds no larger than our thumb struggling with destructive worms in our nurseries we need no prophet to assure us that they are friends as well as our morning and evening serenaders.

That if we apply fertilizers to plants, vines and trees, indiscriminately we are in the position of the farmer who feeds his cattle without observing their likes or dislikes—their wants and abhorrences.

That one of the most significant evidences we have that the interests of fruit growing are alive and advancing, is that the veterans who went forth like John the Baptist proclaiming a new dispensation, the men who laid foundations, whose zeal gleamed brightly, and whose enthusiasm was kindled before many of us were born, are appreciated and honored. Let ill-health or accident befall one of them and expressions of sympathy come from every press in the land. The memory of these forerunners will be indelibly impressed upon us. They will live to see their best hopes realized; the men of the future will point to them as benefactors, and their names will be written in letters of gold by those who follow in their great work.

REPORT OF COMMITTEE ON RESOLUTIONS.

Mr. President and Members of the American Pomological Society:

GENTLEMEN: From the great variety of things that have contributed to the enjoyment of this nineteenth session of our society, and from among those who have by their activity, thoughtfulness, and hospitality added to the success and general happiness of this reunion, it is difficult to select that which should most appropriately be embodied in our closing resolutions. Your committee would like to go into details, mentioning a great many things that seem especially meritorious as matters that should have a permanent place in the report.

The fact is that the display of horticultural progress and taste in the magnificent exhibition of horticultural products, and floral arrangements by the people of Philadelphia and vicinity; the cordial reception and open-handed generosity with which we have been received, and the general air of hospitality that we have been breathing, have captured your committee, and we feel that nothing short of an illustrated volume would do justice to it all.

In view of this we have contented ourselves with the submission for your action the briefest epitome of what could be appropriately said, in the following resolutions:

Resolved, That the hearty thanks of our society be and are hereby extended to the officers and members of the Pennsylvania Horticultural Society for the hospitality with which we have been received and entertained, and especially for the complete arrangements of the halls of exhibition, and the magnificent display of horticultural products by means of which we have obtained a glimpse of the taste and methods which form the basis of the wide reputation which Philadelphia has for being a city of beautiful homes.

Resolved, That the thanks of the society be extended to the officers of the Building Commission, Fairmount Park, Academy of Fine Arts, Academy of Natural Sciences, Union League, Zoological Gardens, and Girard College, for especial courtesies extended to our members.

Resolved, That we heartily appreciate the deep interest in the welfare of our society, and whole-souled generosity shown in the most substantial manner, which designates our President, Marshall P. Wilder, as the right man in the right place; that we regret most sincerely the disability which deprives us of his presence at this meeting, and extend to him our sympathy and hearty good wishes.

Resolved, That in the absence of our worthy past First Vice-President, P. Barry, we miss one who has contributed very largely to the success of our society, and we regret the decision that he has made which takes him from the active positions of work which he has so faithfully and ably filled. We shall still expect for many years to feel the impulse of his presence at our meetings.

Resolved, That the secretary of this association be authorized to issue an address to the various societies organized in the interest of horticultural and pomology in this country, declaring the purposes and work of our American Society, and epitomizing the advantages of membership therein, requesting that such societies make some leading officers members, thus securing the biennial publications for their permanent library use.

CHARLES W. GARFIELD, Michigan,
P. M. AUGUR, Connecticut,
T. V. MUNSON, Texas,
Committee.

OTHER RESOLUTIONS ADOPTED.

Resolved, That the withholding of new and valuable fruits from the general public, or placing them under close restrictions for an unreasonably long period is contrary to the spirit of true philanthropy and the genius of this association.

Resolved, That this society will not discuss the merits of any new fruits held under restriction upon their sale for individual advantage.

THE BANQUET AT THE UNION LEAGUE CLUB, FRIDAY EVENING, SEPT. 14.

SECRETARY BEAL'S REPORT.

The nineteenth biennial session of the American Pomological Society terminated on Friday evening with a banquet, tendered by the Pennsylvania Horticultural Society. At one end of the main hall a platform was constructed upon which was placed a large table in the form of a horseshoe. Long tables occupied the main floor.

Soon after seven o'clock Hon. W. L. Schaffer, President of the Pennsylvania Horticultural Society, was seated at the head of the table, at the right of whom was Hon. P. J. Berckmans, First Vice President of the American Pomological Society. The speakers of the evening and other distinguished guests occupied the platform. An orchestra furnished spirited music for the occasion.

The fine hall was brilliantly lighted, the tables neatly and abundantly supplied, making a scene of indescribable beauty.

Thanks were offered by the Rev. J. S. MacIntosh, of Philadelphia, and after spending about an hour with the substantial part of the banquet, the intellectual feast began.

THE WELCOMING ADDRESS—BY HON. WILLIAM L. SCHAFFER.

Mr. President and Gentlemen of the American Pomological Society:

The Pennsylvania Horticultural Society has had the honor of inviting you here this evening in order that its members and friends might have the opportunity, after the close of your laborious session, of enjoying a few hours of pleasant social intercourse, before your departure to your respective and far separated homes. There is but one unpleasant feature to mar this agreeable reunion, —the absence, on account of indisposition, of your distinguished President, the Hon. Marshall P. Wilder, and your very able First Vice President, Mr. Patrick Barry. We all hope and pray for their speedy recovery.

I now offer you, as the first sentiment, "The American Pomological Society."

First Vice President Berckmans then read the

RESPONSE OF PRESIDENT WILDER.

Mr. President: Words cannot express the regret I experience in not being able to participate with you and my other friends of our nation in the privileges and pleasures with which you are crowning your courtesies to the American Pomological Society. I should have rejoiced exceedingly could I once more personally express to the members of the society over which you so gracefully preside the gratitude I feel for the aid which it has rendered in promoting the interests of our association. This is the fourth time that our society has been the recipient of your generous hospitalities, and for which we now and ever will express our most grateful acknowledgments. No place could be more appropriate for the assembling of our national society than this city, so renowned for its good deeds and good men ; here where some of the first systematic efforts were made for the promotion of the agriculture and horticulture of our country ; here where our tree of American liberty was planted, under whose wide spreading branches more than fifty millions of souls are now rejoicing in the blessings of peace and freedom. And let it ever be remembered that here were once the homes of Brinckle, Buist and James, who were among the founders of our society, and did so much to promote its progress and prosperity.

Mr. President, I rejoice most heartily in everything which has for its object the promotion of the science of the soil, especially in the growth and prosperity of our own association. When I reflect on its remarkable growth and influence, that at its establishment, there were only twelve states represented, and that it now embraces in its organization more than fifty states, territories and districts, all working harmoniously for the advancement of our cause, my heart rises in gratitude to the Giver of all Good that He has permitted me te see this day.

No nation has such grand facilities for fruit culture, and no people have made such rapid progress in that art. When I look forward to the possibilities and probabilities of our vast territory, capable of producing almost all of the fruits of the known world, and its rapid extension throughout our borders, my soul cries out, "Give me, O Lord! a few more years that I may witness more of the progress of pomology in America—more of the progress of liberty, prosperity, and greatness of the American republic."

President Wilder's appropriate and interesting address was well read, and was listened to with marked attention by every one present.

First Vice President Berckmans then announced the second regular sentiment, as follows:

"The Pennsylvania Horticultural Society."

Responded to by President Schaffer, who presented the statistics of the growth of Philadelphia and of the institutions of the Quaker City, all of which are given at length in the Pomological Report.

President Schaffer then announced the third regular sentiment, as follows:

"Pomology of the South."—Dr. Samuel Hape, Vice President of the Georgia Horticultural Society.

Dr. Hape made an eloquent and appropriate response, a copy of which has not been furnished the editor.

President Schaffer then announced the fourth sentiment:

"The Refining Influence of Pomology," and called on Dr. W. J. Beal, Secretary of the American Pomological Society, who spoke in the humorous line, [but was too modest to print his remarks or furnish them for publication — an example in a Secretary not to be commended. — G.]

President Schaffer then announced the fifth regular sentiment, as follows:

"The Growth of Horticulture in the great Mississippi Valley," calling on Hon. Parker Earle, President of the Mississippi Valley Horticultural Society.

Mr. Earle responded as follows:

Mr. President: The Mississippi Valley is truly a great one. It is not only the largest, but it is the richest valley in the world. It embraces twenty states—and they are all large ones—and several vigorous territories in training to become states. It extends from the Alleghenies to the Rockies, and from the great lakes to the Gulf of Mexico. I will not tell you anything about the wonderful richness of our soil, the weight of our farm crops, the size of our herds, the magnitude of our mines, of our seventy-five thousand miles of railway mostly built in a quarter of a century, for you all know that when any nation of the world gets hungry it sends to the Mississippi Valley and gets plenty of food, and when its clothes wear out we send the wool and the cotton to make more.

You have asked me to say something about the growth of horticulture in this great valley. But, sir, the subject is too large and the time is too short. I can truly say that some wonderful things have been done both for and against horticultural progress during the quarter of a century in which I have been a witness and participator in this work. We have destroyed vast and valuable forests and seriously disturbed the balance in natural forces; and now we are beginning to plant new forests that this balance may be restored. We have planted great orchards of varieties from eastern fruit lists, and we have cut them down again because they had no value. But we have experimented as to kinds and methods; we have originated new varieties, and we have made great progress in this way. In fact, the pomological growth of the west has been very wonderful. Twenty-five years ago a dozen bushels of strawberries daily was a fair supply for the Chicago market. Now entire railway trains are required to supply the quantity necessary to furnish the dinner tables of that thrifty city. Fruit-growing and gardening has assumed great commercial importance with us. It is estimated that the amount of our orchard and garden produce entering into commercial channels aggregates fifty million dollars of value yearly.

And this great interest is destined to expand indefinitely. With the experience of years we are learning our limitations, and our confidence in what we can be able to do is better based than it was once. We have learned something of the difficulties to be overcome, and something of how to overcome them. When I began in the business, we did not take much account of difficulties. The fruit grower was always an enthusiast. He was a happy man; and his wife was happy, and his neighbors were happy. There were not any of them rich—in money—but they all had golden harvests just a year or two ahead, and they enjoyed the situation rather better than if they had the burdensome cash already in their pockets. We all felt as good in those days, as a man in Jersey now does who possesses a Kieffer pear tree ; or as a man does anywhere who owns stock in the Niagara Grape ! And that is just good enough. Nature's hand was generous, and overflowing, and perennial as—Mr. President, as Philadelphia hospitality, and that has never been known to fail !

But as I said we have a good deal of experience—the other fellows have got most of the money—and we recognize more clearly the rugged environments of our business, and we are better prepared to meet its difficulties, and to overcome them. And we still have courage to carry us forward—for hope springs eternal in the bosom of your true horticulturist—and imagination may not picture the grand results of our horticulture which the future holds. It will powerfully mould the civilization of a great people. And when the happy time shall come when every poor man's table shall be laden with fruits, and every cottage as well as every villa be adorned by some of the flowers and the arts of horticulture, all men will recognize with generous honors the large part which this great American Pomological Society, and its honored chief, now so unhappily absent from our meeting, have had in the accomplishment of so grand a result.

President Schaffer, after some appropriate words, then read the sixth sentiment of the evening:

"Fruits and flowers of the old world," and called on Rev. J. S. MacIntosh, of Philadelphia.

The address has not been reduced to writing. The speaker was truly eloquent in picturing some of the most beautiful scenes of England, Scotland, and the Continent of Europe. He closed by comparing the fruits of America with those of the old world. American fruits suffered no disgrace by his comparison.

President Schaffer again rose and read the seventh sentiment:

" The Pomology of the Northwest." He called on Oliver Gibbs, Jr., Secretary of the Minnesota Horticultural Society.

Mr. Gibbs spoke as follows:

Mr. President. If you mean by this toast to include the entire territory that I have in mind in attempting to respond to it—a territory too large and varied to define exactly here, but which comprises that portion of the new northwest, which is usually supposed to be mostly beyond, or on the verge of the fruit belt—in short that territory which has attracted hundred of thousands of emigrants in the last few years, as the country for cheap lands on which to make money by raising wheat or cattle, and to found new homes, I should not do my subject entire injustice, were I to dispose of it somewhat as the school boy did of his, when appointed to write a composition about snakes in Ireland and tigers in Africa, and who made his title answer mainly for the composition by writing, "there are no tigers in Africa and no snakes in Ireland;" for with the exception of some specially favored sections and some of the older settled portions, the pomology of this new northwest, is as yet, to say the best of it, largely experimental and not very *fruity*. We have in some parts of this territory, a peculiar and severe climate for trees and plants: intensely cold in the winter, and sometimes very hot and dry in the summer—where the temperature ranges at its lowest from 40 to 50° below zero, and at its highest from 80 to 100° in shade, and the average annual precipitation from about 10 to 40 inches, according to location.

It used to be said of the Maine Yankees, that if two of them were to be placed on a bare rock and obliged to go into business with no capital but the brains in their heads and the clothes on their backs, they would get rich off of each other by swapping jackets; and sir, if you were to put a Yankee upon an iceberg, or place a Quaker there, or a civilized foreigner from any country we know of, it is perfectly safe to say that he would find out how to raise fruit and grow trees and flowers there, or he would leave the place. There can be no permanency to the home of civilized man—in fact his abiding place is not a home, without these things, because there is no contentment there. The place where they cannot be grown, is a place where men are always on the watch to sell out, where everything is done for to-day, where the fathers, as they stay, descend in the scale of being, where the mothers are always weary, where the boys leave the farm, and where the girls ought to leave. Fully realizing the importance of this fact to the permanent development of the new northwest and the happiness of its people, the horticultural societies of the states, territories and provinces out there, have resolutely set themselves to work to overcome the difficulties in the way. To some extent they have succeeded, as an examination and a critical study of the fruits we exhibit here, in this off year of fruits, even with us, will show; and in the opinion of those best qualified to judge, we shall at no very distant day overcome them all, so far at least as to place a very large portion of the wheat growing lands of the northwest on an equality with any of the states in the Union, in the production of the apple, and in reference to forestry—for as pomologists and horticulturists we must never forget that—so far as to cover the prairies and plains in belts, with timber, without which a country as cold as that can never be said to be fairly inhabitable. Mr. President, these are sanguine words in regard to our fruit prospects in the new northwest, but I believe them to be true. You have seen our northwestern grown Duchess of Oldenberg on your tables here; our Wealthy apple, too, our beautiful hybrid crabs that taste like apples, and our lovely grapes. Can you excel them—any of them, in out door culture here in the east or down south for that matter?

And as we have delved in old records, and ransacked the world to find out where this blood in our few successful sorts of apples came from and why they do so well with us, where hundreds of eastern sorts have failed under similar trials, our minds have opened and taken in the fact, that it is not so much a question of climate and soil as one of adaptation. It now seems to us as we trace the Duchess of Oldenberg to interior Russia, and have followed it up by recent explorations, that the principal reason why the east has so far beaten us in apple culture is that you have had this adaptation in your favor in planting the apple of the coast regions of Europe. We in our thirty years of general failure have been copying after you in the selection of races of the apple, without any adaptation at all except in the few sorts that you had, happily for us, from the Russian steppes. We now have facts on which to base a reasonable conjecture that what we call the severities of our climate offer no insuperable barrier to our pushing even the true winter apple well up towards the northern limit of the wheat plant. Prof. Budd and Charles Gibb, tell us that at Simbersk, the home of the Duchess, and at Kazan where the winters are as cold, snows inconstant, changes as sudden, and summers as hot and dry as the worst of ours, are to be found the largest commercial orchards on the globe –not alone of the apple, but of the pear, the cherry, and the plum, and that they found there last fall, the steamboats and barges of the Volga loaded to the water's edge with winter apples going south to market. To that country and to the production of new seedlings of our own we look for the extension of our pomology.

Mr. President, it has been a great pleasure to me, as the throngs of people have passed through your halls this week, and stopped to talk with me about the Minnesota fruit, to find so many people as there were who have friends in the new northwest, lately settled there, and to note the satisfaction it gave these visitors to find the evidence that their friends have not gone beyond the limit where it is possible for the settlers to raise their own fruit. I could see that many an anxious one's heart grew happier with the thought that besides getting some money out of wheat the settler out there might have a pleasant home. From the apple tree the imagination soon brings into view the shade tree, the evergreen, the rose bush, the lilac, the creeper over the porch, the bed of flowers upon the lawn. They all go together.

I have spoken of forests. The question of adaptation is of the first importance in this, but it is being studed out and worked out. Forests will yet cover the arid regions of the northwestern plains. Whether the rainfall will be increased thereby or not, evaporation will be retarded, which is practically all the same. Trees will cast their grateful shade, flowers will cluster round his door, and fruits, —home grown,—will cheer the table and the fireside of the pioneer even there.

One word more, Mr. President; and now I want the attention of the millionaires, as I see several of them present. As we have looked admiringly and may be with a little envy to-day upon the smiling face in marble of the sturdy old merchant in Girard College, have not some of you on this occasion, or have you not at some other time, had the thought come into your mind, "Oh, what could I do with my wealth to create such a memorial as this institution? What would do so much good, what would make me so honored and so loved as this? What other institution can I endow, that will give me a place among the few names that are not to fade out of the memory and records of man, and enable me, if perchance I shall be permitted, when the great change comes, whatever it is, to retain an interest in earthly scenes, to look over my work in this life and watch and enjoy its beneficent results hereafter?" It may seem to you that the places of great endowments are all filled, that nothing else can be devised beyond the commonplace; but, gentlemen, the philanthropist who comes forward to found and endow a school of Horticulture and Forestry in the Northwest will provide for the greatest need of the times and for all future time in that golden empire, and will place his figure in bold relief against the Western sky, to be gazed upon with veneration and affection, and grow brighter and grander in the view, and when in the far future mere military heroes shall be forgotten or looked upon as curiosities of a barbarous, or semi-barbarous past, every forest in the West, every improved fruit or flower, every improvement of the face of nature in city or country, from the advancement of the culture of plants, every happy home, will be associated with his name. The whole question, whether hundreds of square miles of the Northwest shall remain or relapse into a desert, or be made to blossom into a land of homes,—the question whether other hundreds of square miles shall wait, for generations, to grow comfortable, or, by the short cuts of knowledge, prove horticulture and forestry a relief to those who are there now or are soon to follow,—can be solved by such an institution, liberally endowed, as no other means can do it. And when horticulture and forestry shall become established over the West by such an institution, nothing else can so train young men and young women in these learned professions, to continue the work to the end of time. Our State colleges of Agriculture are doing all they can for these sciences, but their means are too limited, and their liberty is too circumscribed by lack of patience and appreciation of the average politician who goes to the Legislature. I am sorry to say they are not all the pets of the legislature as it is said is the one in Michigan. We want a school that can work with scope and means and freedom on long headed and level headed plans for the public good, and yet be out of reach of popular clamor. We want a school established with a central head and with experimental stations in the several natural divisions of soil and climate; a school that will know no State lines, and nothing that is not, or not likely to be practical. Where is the happy millionaire or syndicate of millionaires who will give it to us?

Mr. President, I shall carry home with me a pleasant remembrance of the hospitality of the Pennsylvania Horticultural Society and the citizens of Philadelphia. Nothing has been omitted to make the visit of the members of the American Pomological Society agreeable to themselves, or useful to the communities they represent.

President Schaffer then announced the eighth and last sentiment of the evening.

"Pomology of Canada." Prof. William Saunders, President of the Fruit Growers' Society of Ontario, London, Canada. I call upon Mr. Saunders for a response.

This was given in very fitting words by one who has long been active in advancing the interests of Canadian Entomology and Horticulture. The editor has not been able to secure a copy of the address.

Some appropriate remarks were made by First Vice President Berckmans, and the company dispersed, subject to the call of the executive committee to hold its next meeting in 1885, in the state of Michigan.

Thus closed a very large and successful meeting of the American Pomological Society.

REPORT OF THE GENERAL FRUIT COMMITTEE.

To the President and Members of the American Pomological Society:

GENTLEMEN:—The undersigned, on behalf of the General Fruit Committee, respectfully reports that he has been diligent in his efforts to secure reports from all the states, territories, and districts embraced within the scope of the Society. A circular was issued in May, 1882, and sent to the chairmen of the several state committees; a copy of the circular is appended, and is as follows:

AMERICAN POMOLOGICAL SOCIETY.

(ORGANIZED 1848.)

To............

Chairman Fruit Committee, for State of............

DEAR SIR:—At the last session of the American Pomological Society held in the city of Boston, September 14th, 15th, and 16th, 1881, you were appointed chairman of the fruit committee of your state. The duties of this committee are defined in the society's by-laws, as follows:

"State Fruit Committees, consisting of five members each, for every state, territory, and province represented, and a general chairman over all, shall be appointed biennially. It shall be the duty of the several state fruit committees to forward to the general chairman, one month before every biennial meeting, State Pomological Reports, to be condensed by him for publication."

It is customary for the chairman of the state fruit committee to select his associates, and you are respectfully requested to organize your committee at the earliest moment practicable, if not already done, by selecting the most competent and trustworthy persons in different sections of your state to aid you in collecting the information desired by the society, and transmit the same to me as early as the first of September next.

The nature of the information desired may be briefly stated as follows:

1st.—Species of Fruit. What species of fruit, as apple, pear, peach, plum, cherry, &c., &c., are grown successfully in your state?

2d—Varieties of Fruits. What varieties of these fruits have been found, by experience, best adapted to the soil and climate of your state and its various parts? The degrees of merit should be stated according to the scale adopted in the society's catalogue, viz: those worthy of cultivation designated by one *; those of great superiority and value by two **; those of more recent introduction and giving promise of excellence †. In this connection you will please examine the lists of varieties, if any, recommended in the societies catalogue, for your state, and suggest such changes or additions as may, in your judgment, be necessary.

3d—New Native Varieties. If there are any new varieties of recent origin in your state, giving promise of excellence, you will please make special note of them.

4th—Synonyms. Give as much information as may be in your power in regard to the different names by which the same fruit is known in your state.

5th—Obstacles to Successful Fruit Culture. What are the chief obstacles to successful fruit culture in your state, as regards soil, climate, insects, diseases, etc., and what remedies have been most effectually employed ?

6th—Culture and Pruning. What treatment of the soil of fruit tree plantations, and what system of pruning, have yielded, in general, the best results?

7th—Storing and Keeping Winter Fruits. What methods are most successfully practiced?

8th—Packages. What sort of package has been found most advantageous, especially for shipment to distant markets, and especially for Europe ?

9th—Statistics. If convenient, statistics showing the extent and progress of fruit culture in your state.

If. for any reason, it may not be in your power to report upon all the points enumerated above, be kind enough to do what you can, giving precedence to 2d and 3d, relating to "Varieties of Fruits."

In cases where state committees have made full reports at recent sessions, they will not be expected to go over the same ground again, but will simply report such changes in regard to the value of varieties, as later experience may justify; and such new facts in regard to the general subject of fruits and their culture, keeping, marketing, etc., as may have come to light since the last report.

The 9th point, "Statistics," showing the extent and progress of fruit culture in your state, will always be interesting and instructive. The extent of recent planting, the largest orchards, the varieties most extensively planted, average prices of the various fruits, estimated value of total fruit production in the state, etc., etc.

This circular is sent out at this early period for the purpose of giving committees ample time to organize and have the benefit of two full seasons' experience before making up their report. The next meeting is to be held in Philadelphia, in the month of September, 1883.

And now I ask of the state committees to continue their kind co-operation. Through their reports the society must accomplish its most important work.

The thirty or more reports in the Volume of Transactions, just published, contain a vast fund of information in regard to the fruit culture of our country that could not be obtained from any other source.

If you have not received a copy of the last Volume of Transactions, you can procure it by addressing Prof. W. J. Beal, Secretary, Lansing, Mich.

Respectfully,

P. BARRY,

Chairman General Fruit Committee, Rochester, N. Y.

April, 1882.

REPORT FROM MINNESOTA.

LAKE CITY, MINN., Oct. 30th, 1883.

Prof. W. J. Beal, Secretary American Pomological Society, Lansing, Michigan.

MY DEAR SIR:—I would recommend to the committee on the revision of the catalogue that they erase from the Minnesota column the stars now printed against Ben Davis, English Russet, Haas, Golden Russet, Late Strawberry, Maiden's Blush, Rambo, Red Astrachan, St. Lawrence, Sops of Wine, and Talman Sweet. They are all growing here, but have not been classed by us as worthy of general cultivation since the hard winter of 1873.

2d. Add a star for Alexander and Wolf River.

3d. Transfer Edgar Co. Red Streak to the W.'s, and call it Walbridge, as it is more generally known as Walbridge. Give Edgar Co. Red Streak as its synonym, and change its color to r. s., for red striped.

4th. Mark Wealthy, Alexander, and Wolf River as red apples, and Utter as red striped. An apple should be given the color it shows at maturity, under its best conditions.

5th. Give Yellow Transparent a star.

In the Crab list, double star the Whitney and add the following with double stars; Early Strawberry, Beecher Sweet, Orange, Conical, Orion, and Minnesota.

In Gooseberries star the Houghton.

In Blackberries star the Snyder and Stone's Hardy.

In Grapes star the Worden and add Janesville with a star.

In Plums add Forest Garden, DeSoto, and Weaver, and give them double stars, and describe them as follows:

Forest Garden,—m., r., r., v. g., F. M., E., Am.

De Soto,—m., r. o., y. r., v. g., F. M., M., Am.

Weaver (free stone),—m., flat r., v. g., F. M., M., Am.

In Raspberries star the Philadelphia and change Seneca from dagger to star; also star the Gregg.

In Strawberries erase star from Agriculturist and add it for Capt. Jack and Glendale. Add Downer's Prolific and give it a star, and double star the Wilson.

We have many promising sorts of apples, grapes, strawberries, and raspberries recently introduced, or just coming into bearing; but as I am unable to give their descriptions fully, I will leave them out. Next year we will try to take notes of all our successful fruits, at maturity, with a view of having a complete Minnesota list for the Michigan meeting in 1885.

Describe the new Crabs recommended as follows:

Early Strawberry,—m., r., r.s., g., F., S., Minn.

Beecher Sweet,—m., r., r., v. g., F. M., E. A. Minn.

Orange,—m., r., o., g., F. M., L. A., Minn.

Conical,—m., c., r., v. g., F. M., E. A., Minn.

Orion,—l., o., r. s., g., F. M., L. A., Minn.

Minnesota,—v. l., o., y. r., v. g., F. M., L. A., Indiana.

Please refer this to the committee.

Yours truly,
OLIVER GIBBS, JR.,
Sec'y State Horticultural Society.

WHO READS AND WHO CARES?

A TRIBUTE TO COLONEL D. A. ROBERTSON.

[The following paper and the proceedings that ensued after its reading were omitted from the regular report in order to afford Colonel Robertson an opportunity to furnish notes of his remarks, which are now printed in full.—SECRETARY.]

Horticultural writers and speakers are a class who do a great deal of public work for little pay. They are generally satisfied if they have reason to believe that their labors are appreciated by a few and likely to be of benefit to the many; but there are times when their courage flags and their spirits fall for want of even this encouragement; and it is to help some of them over their fits of despondency that I seize upon a text and an opportunity going to show how, after many days, the bread may return upon the waters to sustain and cheer one who has sent it forth.

"What use in writing? Who reads and who cares?" This is the text. I take it from a postscript of a letter from F. K. Phenix, in reply to one urging him to continue his writings on the production of new and improved varieties of the apple by careful attention to seedlings.

"Who reads and who cares?" Let us see. Twenty or more years ago, when northwestern farmers were getting their first discouragements in orcharding, from winter killing and summer blight, Col. D. A. Robertson, of St. Paul, published articles at various times in the Minnesota papers, in which the theory was advanced and argued out that for immediate success in the culture of tree fruits it was necessary to get varieties already adapted by long processes, in older countries, to a climate similar to our own; and in 1867 he read an elaborate essay on the subject before the Minnesota Fruit Growers' Association, of which he was president, in which he showed by facts ascertained in the course of his various studies that in the interior of Russia was to be found the counterpart of our Minnesota, Dakota and Manitoba climate, in aridity of air, hot summers, cold winters and inconstant snows, and at the same time immense orchards of excellent apples, pears, cherries and plums, at points varying from the latitude of St. Paul to 500 and more miles nearer the North Pole.

This essay, which was entitled "Climatology in its Relation to Fruit Growing," was printed in the St. Paul Pioneer, and portions of it in other papers at the time; and in 1873, when the proceedings of the Fruit Growers' Association were gathered up and incorporated into the first report of the Minnesota State Horticultural Society, it was given a place in that record. It contained about all the wisdom there was then or is now extant in this country on the subject of climatic adaptations in the selection or improvement of races of fruits for the Northwest. It was an accurate and a philosophical dissertation, the result of close observation and deep study; and the ideas therein presented, the facts brought out, and the suggestions made, were the foundation upon which all the American work has been done in bringing out the Russian fruits which are now attracting such widespread attention. I quote two paragraphs to show the scope of the essay:

"We must, I think, for entire success in our day and generation, procure by some means for naturalization in Minnesota, varieties which thrive in the cold countries referred to, and especially in the *continental or interior* parts of Russia and northern China, where the climate is like ours, not only intensely cold in winter, but also dry as compared with maratime or lake coasts, and hot in summer, and the growing seasons of which are short like ours."

And again:

"Is there not to be found somewhere in the north, at least one lover of horticulture who has the necessary knowledge and the will to go and collect from the countries referred to, varieties of fruit trees for adoption here, and who has, also, what is essential, money enough to pay his way? Such a man, who will thus devote himself to the public good, will confer an incalculable benefit on our state, and entitle himself to the rank of a public benefactor."

Remember that articles of this import were published by Col. Robertson prior to any known effort at importations of fruit cions from Russia (except those of Thomas Andrew Knight, in England, in the last century, from which came our Duchess), and now let us see how they and the essay of 1867 have borne fruit.

In 1866 A. G. Tuttle, of Baraboo, Wisconsin, commenced the experiment by cions from St. Petersburg, obtained through Hon. Cassins M. Clay, then United States Minister to the Russian Government. He followed it up by getting other cions from Moscow; and within a year from the final publication ot the elaborate essay in 1867, a scheme was hatched in the fertile brain of Wm. Saunders, Superintendent of the Agricultural Department grounds at Washington, to import the Russian apple stocks by wholesale and make the experiment general throughout the north.

There being no commercial sources then known to which he could apply, Mr. Saunders commenced gathering up and forwarding American trees and plants to the Russian Botanical gardens at St. Petersburg, and after continuing this work for two years, he applied to Dr. Regel, the government director there, for cions of Russian fruits. The result was the importation of the well known apple cions of 1870, which were planted and grown in the Washington grounds till the winter of 1875 and 1876, and then sent out under the names and numbers to all parts of the United States and Canada where they were wanted for trial, and whose fruits have been coming into notice within the last two or three years.

Twelve years later, in 1882, Charles Gibb, of Abbottsford, Canada, and Prof. J. L. Budd, of Ames, Iowa, were wandering in the regions of the Volga, searching out the orchards of Simbirsk, Kazan, Kursk and Saratov, as described by Colonel Robertson from those old records in 1867, and the cherry orchards of Vladimir.

Mr. Tuttle, who appears to have been the pioneer importer, told me on the cars returning from Green Bay, a few days ago, that his attention was first drawn to the subject by the writings of Colonel Robertson. Mr. Saunders does not remember, as he informs me by letter,where he got his ideas that led to the government importation, except he had heard and read that Russian sorts like the Duchess and Tetofski were the only ones showing adaptation to the extreme north, and the pressure was upon his mind that the northern fruit list might be extended by a further trial o Russian trees; but nowhere else in the horticultural literature of that time have I been able to find any writings of this elaborate character on the subject, or any such facts as are presented in this essay, and the indications are too strong to be overlooked—perhaps some of our Minnesota Senators or Representatives may know—that Col. Robertson's facts, ideas and appeals were disseminated among the agents of the Government at Washington, through. the press or by personal interviews, and had the influence that resulted in the very efforts he had so forcibly suggested years before. But however this may be, Charles Gibb informed me last fall that wherever he and Prof. Budd traveled in their searches for orchards east of Moscow, they used this essay as their guide-book ; and Prof. Budd, in a recent letter, writes about it as follows :

> "It served as an incentive to open up correspondence with Russian fruit growers, and specially directed our steps to Simbirsk; and when Gibb and myself stood on the high bluffs west of the Volga, overlooking thousands of acres of ground covered with apple and pear trees, we remarked that the reality far exceeded the idea expressed by Col. Robertson in the Minnesota Horticultural Report. We also made a similar remark when passing through the great cherry growing sections of Vladimir. Beyond all doubt Col. Robertson deserves the thanks of the people of the Northwest."

"Somebody must go to Russia," was the idea of Col. Robertson. Mr. Tuttle, in 1866, and Mr. Saunders, in 1870, sent there for cions and made a beginning. "Somebody had to go to Russia," said Charles Gibb in his report in 1882, "and Prof. Budd and I went." Until a month ago Col. Robertson remained in entire ignorance during all these years, that his studies and writings on this subject, in 1867, and before, had borne any fruit whatever. His bread had been cast upon the waters. That was all he knew.

The importance of the effort made by Mr. Tuttle and Mr. Saunders, and the value of the personal searches of Charles Gibb and Prof.

Budd, the importations they have made and that are to follow, the trials and the siftings of sorts that are to be made, and whether as the results therefrom, our dry interior prairies are to be eventually covered with orchards of the apple, the pear, the cherry and the plum, as similar regions hundreds of miles to the north of us in the interior of Russia are now covered, is not the object of this paper to discuss. All I have aimed at is to answer the question of Mr. Phenix, "*Who reads and who cares*" when new or valuable facts and thoughts are sent out through the press? The lesson and the encouragement is to us horticultural cranks to go on in our chosen work. For if I have proved anything, it is that in seventeen to twenty years by the almanac and the watch, we may wake up some morning and find ourselves famous and honored for the good we have done; and this is better than to be killed in foreign wars and have our names spelled wrong in the dispatches. For anything written or said that helps anybody out of their difficulties, *somebody reads and somebody cares.*

OLIVER GIBBS, Jr.,
Secretary.

Lake City, January 5th, 1884.

Upon the conclusion of the reading of the above paper, Col. John H. Stevens rose and said:

Mr. President: The facts stated by the secretary are well known to all the older members of this society. Col. Robertson has done more for the advancement of general horticulture than any other citizen of the state. He long ago mastered the underlying principles, and had the happy faculty of instructing the people in their work in trying to grow trees in this climate, and gave much of his time and his best thoughts in his writings for the press and in public addresses on the subject. I am happy to see that he is once more present with us to-day, in person as well as in feeling; and as a proper recognition of his services in the past, I move that he be declared an honorary life member of the Minnesota State Horticultural Society.

The motion of Col. Stevens was unanimously adopted.

Col. Robertson then said: Mr. President and members of this Society; the honor you have conferred upon me is very gratifying. For a number of years past other objects than horticulture have claimed my more particular attention; but I have been well aware, at all times, of the importance of your work, and have regarded with pride the increasing strength and influence of your society. Younger heads and younger hands than mine must in the future carry on your work; but so long as I may be able to do so, I will be most happy to aid you in any way in my power, and will, as heretofore, always continue to take a lively interest in your proceedings. May success ever crown all your efforts for the public good.

And now, Mr. President, and members of this society, I would like, were it not taking up too much of your valuable time, to say something more on one or two topics.

[Several members : Go on Colonel; go on.]

I would like to express with more becoming propriety, my feelings of heartfelt pleasure and gratitude, evoked by the surprise, the honor and the distinction you have so generously associated with my name, and by making its mention, an inexpungable page in the horticultural history of Minnesota; and also for mentioning it in the history of this society as worthy to be associated with yours, gentlemen, who are the practical horticulturists of this state, and you, whose labor, above that of all others, has won for this society, from the recent Congress of the most eminent horticulturists in this country, representing the horticultural societies of the United States, of the east, the west, the north and the south—has won for it, I repeat, the highest recognition possible to be expressed by any decisive authority, which recognition has won for this society and state, the highest prize for excellence in apple and grape culture, which was attested by the unanimous award of the Wilder Memorial Medallion, which places this state in the front rank of American Pomology, not only for what has been already accomplished, but for the assured promise of progressive improvements in all branches of plant culture; for, it is successful apple growing that assures in any climate successful horticulture, in general.

The competitive exhibition of the apples of this state, of both seedling and grafted trees, which was made before the late Pomological Congress, side by side with collections of apples from the other states, the old and the new states, became, when submitted to the ordinary tests of excellence, a most surprising demonstration, ocular and gustatory, and it was this that won for our society and for Minnesota the highest award for success in apples, and grape culture also. Although this distinguished award has been scarcely heard of by our people, because not more fully noticed in newspapers, the time must soon come, when it will be better known, and its importance more deservedly appreciated, and then the success already accomplished, as attested by the Wilder award, will be considered as worth to this state not only hundreds of thousands, but millions of dollars; and then, too, this estimate will not be considered as a wild exaggeration of our horticultural enthusiasts. The recent Pomological Congress, in which your secretary was the only representative of this society and state, will be the date of a memorable epoch in the history of Minnesota Horticulture. Your secretary has made his comprehensive report, so I need not further dwell upon this most interesting and suggestive topic. I cannot, however, close it, without adding that this society, and the people of this state owe to him their hearty acknowledgments for the completeness of his preparatory labors, and for the fidelity and ability with which he performed his representative trust, which was essential to the achievement of this, our grand pomological triumph.

I again thank you for the honors you have conferred upon me, and for the opportunity to make these remarks.

IMMEDIATE INFLUENCE OF POLLEN.

At the recent meeting of the American Pomological Society there was an interesting discussion upon facts presented by J. .H Hale, J. B. Rogers, J. T. Lovett, and others, indicating that in planting staminate strawberries to fertilize the pistillate varieties, the latter are not only made fruitful, as all well posted strawberry growers know, but the color, texture, size, and perhaps even the flavor will sometimes vary according to the character of the staminate variety used in the process. Many facts were given to support this theory, which if true, gives us more power in the improvement of our small fruits than has heretofore been thought possible. Upon this basis we may possibly correct faults even in the staminates themselves. The Sharpless, for instance, by having some neighbor more prepotent than itself in the influence of its pollen, may be given an outside finish that will resist the rot in hot and rainy weather, that so often spoils the largest specimens of the berries before the pickers can "get there." On my own grounds in a small experimental bed last summer, I found a row of Crescents having throughout the season the color and firmness of the Wilson. I was puzzled with it then, but now, under the new theory, can account for it by referring the change to the benefit from the row of Wilsons that grew next to it; and my Glendales growing alongside of Wilsons were very bright in color, although said by others to be often of a dull, dirty hue. And why may not some of the many variations of apples upon the same tree or neighboring trees of same sorts be due to this immediate influence of prepotent pollen, either at the time or through reversion or heredity? It is usually supposed that the change in the character of the fruit from the effect of foreign pollen becomes apparent only in the next generation through the seeds, yet any one who will read Darwin's "Variation of Plants and Animals under Domestication" will see that cases of the contrary, namely, immediate effect upon the receptacle of the seeds or what we call the pulp or fruit, are not very rare. The most notable case given in this work is that of the St. Vallery apple, whose stamens being abortive, the children in the neighborhood apply to them pollen from other varieties of apples, and attaching each their own name to the spur or blossom fertilized by this pollen, claim and receive from the tree in the fall, each one a different fruit from the branch they had fertilized and labeled. The study of blossoms and seeds lies at the base of all systematic improvements in fruits as well as flowers.

Below will be found the remarks of Messrs. Rogers and Lovett, above referred to, and an interesting letter from Mr. Hale on this subject. G.

J. B. Rodgers, of New Jersey. This year the Manchester has surprised the growers on account of the large size it has attained, when planted near certain varieties as a fertilizer for it. When first grown on Mr. Battey's place, where the flowers were fertilized with the Wilson, it resembled the Wilson, and in many cases only a close inspection could determine the distinction between the two. Last year many experts were fearful that there were two or more berries put out under this name, as the color of the fruit was so variable. This year, however, has demonstrated that size, shape, color, and firmness is greatly altered by the varieties near which it may be planted. When the Wilson is used, the Manchester is small, hard, not very productive,—poor in all respects except color. Sharpless gives largest berries, although apt to produce sports in shape of the Manchester, also renders in most instances a more firm carrying berry. Bidwell gives good results, in shape uniform, deeper color, variable as to firmness. Cumberland Triumph gives a berry much like itself in all respects. Miner's Prolific, as to results much the same as the Wilson.

Early in the summer of 1882, Mr. Hovey having advanced the claim that the Manchester and Hovey seedlings were identical, a very close scrutiny was had into the merits and characteristics of the Manchester. Berries were found of several shades of color and sizes. Mr. Hovey, after a while abandoned the assertion that the two varieties were identical, but not before the fact that fertilization with different varieties seemed to produce variable results as to color, had been noted. The Manchester, as exhibited at the New York Horticultural Society exhibition this summer, raised by the side of different varieties, clearly proved this assertion, and this on the grounds of several persons, some of whose places were 100 miles apart. Manchester by the side of Cumberland Triumph, gave the same results this season in three cases, one in New Jersey and two in Connecticut, and each widely separated.

In a conversation with Mr. Durand on the fertilization of varieties one with the other, and the effect that it had in the form, shape, color, and flavor of the berry the first year, he said that there was no doubt that certain varieties made much better berries in all respects if planted near one another. This was in respect to the difference observable in the Jersey Queen when planted in close proximity to some varieties. Last year the most magnificent crop ever seen was on a bed near the Bidwell. The two or three rows next the Bidwell were immense in size, good color, perfect berries, while in the same bed a few rows near the Sharpless, were much inferior and smaller in size. This effect does not seem to be confined to pistillate varieties only; even hermaphrodites partake of the size, shape, color, and flavor one of the other. The present season in my experimental beds, Sharpless and Primo, set side by side, it the same row, blossomed about the same time. The Primo partook of the shape of the Sharpless, which were sports, in size two or three fold larger than Primo by themselves; color lighter, and softer than on the other row. The rows from which the plants both of the Sharpless and Primo were taken to set in the row, were turned about but not within the same soil or eight feet from one another, produced as to Sharpless the same general characteristics of berry as the other, The Primo, however, had only the average berries as to size, shape, and color, whereas the Primo fertilized with Sharpless were the largest specimens ever seen. A prominent nurseryman wishing to have a sample of the Primo engraved for his catalogue, declined the offer of taking such from a quart picked from the plants near the Sharpless, giving as the reason the public would be deceived from the size. In this case the productiveness of the berry was very much increased. From observation and experience I believe that many of the contradictory reports had from the new fruits in experimental beds arises from the uncongenial neighbors planted near. In many instances may not the result of a whole year's labor be lost from the same courses.

I would not have it inferred that I wish to give any undue preference to the Manchester by these remarks, only that like the Concord among the grapes, from certain causes taking a high place and giving a stimulus to grape culture. So the Manchester possessing, as it would, such a marked preference to certain varieties, as a fertilizer, has, as it were, opened a new field for experiment. When experiments are made over a more extended field, results may vary.. Only such a short time has elapsed since the first observations were made, that nothing conclusive can be determined, only extended and thorough experiments can fully demonstrate the value of this subject.

This subject of the effect of the male plant upon the fruit has been under observation by the members of the New Jersey State Horticultural Society since 1881. At the annual meeting held in February of that year, Mr. C. W. Harrison asked if pistillate varieties were less firm than perfect flowering varieties? He had found that Gypsey, fertilized by Black Giant, partook of the nature of the latter. Champion fertilized with Great American resembled it. Their resemblance was very apparent in color and firmness of flesh. Pale berries fertilized with dark ones he was sure would be improved in color.

J. T. Lovett cited a garden in which some years ago were Wilsons and French Seedling strawberries, and no difference could be detected in the looks of the fruit. The flavor of the Wilson was also improved. The next year, 1882, it was noticed that Glendale and Sharpless planted side by side produced berries on each row possessing characteristics of the other, and where they had run close together it was still more marked. In picking two or three quarts of the Glendale, a large proportion would show characteristics of the Sharpless.

The subject of the effect of the pollen upon pistillate varieties of Strawberries came up before our State Horticultural Society some years ago, when it produced much discussion. It elicited the expression of several growers of wide exerience. Without an exception they testified that pollen from perfect flowered varieties not only exerted an influence, but a most decided one, upon the fruits of pistillate sorts. I have previously noted the phenomenon, and set about the following spring a series of experiments to ascertain to what extent the influence of a pollen-bearing variety was transmitted to pistillate ones through the fructification of the flower. I was surprised to learn that it was so great as to render it of a widely different character, almost unrecognizable, transmitting not only the color of the pollen-bearing variety, but the size, form, and texture of fruit as well.

Mr. J. T. Lovett further said: I have experimented with melons also, and have found that the male element affected the melon as well as the seeds. I am aware of the fact that the subject before the house is one bearing upon vegetable physiology, but if the pollen fertilizing the flower of a pistillate variety exerts no influnce upon the pulp of the Strawberry, why plant pollen-bearing varieties near pistillate ones? or, in other words, why fertilize the blossoms of pistillate varieties at all? For analogy's sake I extended my experiments to melons, and found the influence of the pollen fertilizing the blossoms equally potent in its influence upon the flesh of the fruit. Seeds of musk melons were placed by the side of cucumbers, and also in an isolated location. Those near the cucumbers partook of their character to an extent that rendered them unpalatable, while those grown where the blossoms were self-fertilized were excellent. I took the precaution to have all the seed used in the experiment taken from the same melon.

W. C. Strong, of Massachusetts. I had Manchester between Sharpless and Charles Downing, and it did well. Mr. Capen, of Boston, has had wonderful results with the Manchester fertilized with Charles Downing.

P. J. Berckmans, of Georgia. I think this influence of pollen might largely account for the variety of success with certain berries, even more than a variety of soil.

H. M. Engle, of Pennylvania. The remarks of Mr. Rogers open up a great question. I should like more experience on this point because we have so many pistillate varieties.

E. Williams, of New Jersey. I never had anything produce better on my grounds than Manchester fertilized with Sharpless and Charles Downing. I have seen a bed fertilized by Wilson that failed.

Secretary Beal, of Michigan. This is an exceedingly interesting topic. If the results are as claimed by the former speakers, they are indeed wonderful. The edible portion of the strawberry is not a true fruit in the botanical sense, but a large *torus* or *receptacle*, which is the tip end of the flower stem very much enlarged. This is a promising field for many well tried and often repeated experiments.

LETTER FROM J. H. HALE.

ELM FRUIT-FARM AND NURSERY,
SOUTH GLASTONBURY, CONN., March 6th, 1884.

Oliver Gibbs, Jr.,

DEAR SIR:—Your favor of the 1st just at hand, and I am glad to be able to comply with your request and give you what few facts I have in regard to the cross fertilization of strawberries, specially as regards the immediate effects on the fruit of the pistillate varieties.

In reply to the question, what perfect flowering varieties shall we plant to fertilize the Crescent, Champion, Manchester or other pistillate sorts. The general answer would be, plant *any* that blossom at the same time as the pistillate to which you wish to supply the pollen.

However, from a somewhat careful study of this question for some years past, I have become convinced that the *size, color, form. texture and flavor* of the pistillate to some extent depends upon what variety furnishes the pollen to fertilize its blossoms, and will give you what few facts I have that bear on this question. Crescents fertilized by Wilson's Albany gave medium to small sized fruit, bright in color, poor in flavor, and moderately firm; while Crescents with Downing to fertilize it gave larger fruit, not as perfect in form, much softer, dull in color and of very good flavor. With Sharpless the Crescent was of increased size but not as firm as when grown with the Wilson. Fertilized by the Bidwell the Crescent had a number of the berries that were of the peculiar form of the Bidwell. And the only coxcomb Crescents I have ever seen were those fertilized by President Lincoln, a variety that has a majority of misshapen berries.

The Manchester, fertilized by Wilson, Finch, Mount Vernon, Cumberland Triumph or Miner, and every berry was as perfect in form as though run in a mould; while Manchester with Sharpless gave a number of berries *similar in form to the Sharpless.* Fertilized by Cumberland, Manchester was pale in color, quite soft, but of fine flavor; while fertilized by Wilson they were *firm*, of rich bright color, but quite acid and of inferior flavor. Manchester, fertilized by Black Defiance, was even darker in color than when with Wilson, and of superior flavor, almost equal to Black Defiance, itself; and the difference in color between these and the Manchester fertilized by Cumberland was so marked that it was hard to believe that they really were Manchester, grown on soil of like character, planted at the same time, manured in the same way, only forty rods apart, but fertilized by different perfect flowering sorts. Champion is not as dark in color or as acid, when fertilized with Cumberland Triumph, as it is with Wilson.

These and other marked changes that I have noticed have convinced me if that I have a pistillate strawberry, that under ordinary conditions is lacking only in flavor, I can improve this to some extent by planting with it, some perfect flowering variety of high flavor, and so on through the whole list—size, color and texture—each of these can be improved by the proper selection of perfect flowering varieties having the qualities that are deficient in the pistillate when grown without care or thought in the matter.

Even the perfect flowering varieties themselves are more or less affected by other perfect flowering ones, if grown with or near them. Thus Wilson and Sharpless grown together the past season gave larger, more irregular and better-flavored Wilsons than when grown alone, while the Sharpless were darker in color, firmer, and more acid than when grown alone; and from my present lights on the subject, if I were growing the Wilson strawberry for profit, every third row would be planted with Sharpless or some other perfect flowering, large berry, to increase its size; while to improve its flavor, I would plant President Wilder, Downing, or other fine flavored varieties. I shall experiment further, in this direction and trust that you and others will do the same.

Very truly yours,

J. H. HALE.

THE LAW IN CROSS-BREEDING.

In reference to fruit trees and plants, as was stated in the debates at the annual meeting, all the facts I can find, new or old, by reading, by observation, and by inquiry, point one way in this: That the mother tree or plant is most likely to impart the constitution, habits of growth, and external finish to the new seedling, and the male plant the quality and the season of the fruit. Mr. Peffer has always, I think, found it so in his experiments; and Dr. E. Lewis Sturtevant, at the New York Experiment Station, at Geneva, who is very cautious in statement, told me last fall that so far the facts developed in his work indicate the same, although he did not claim to have found enough to prove it to be a law. In illustration he showed me a lot of seedlings from the Turkish Cap tomato, a rot proof variety. The tomatoes on all of these seedlings were like those of the mother plant in respect to being free from rot, although their size, shape, and quality was as various as might be expected from unisolated pollen, mixed as it would be liable to be by the winds and insects. It may be reasonably expected that in this case, when both pistils and pollen shall be perfectly isolated, and the pollen being taken from a choice, hardy variety, among some of the seedlings will be found a good tomato on a stock that will make it rot-proof, and whose character may be fixed as a distinct variety.

Gardeners as well as fruit growers and farmers have much to hope for in the work of the agricultural experiment stations in the discovery of facts bearing upon this law.

In our efforts to originate hardier, better, and longer keeping fruits by seedling production, we shall save much time and labor, (heretofore wasted in hap-hazard work, where not one seedling tree in ten thousand is ever an improvement) if we find out and apply the laws of variation whereby improved conditions around the parent plants, impart a tendency to improvement in their progeny, and the law of cross-breeding whereby these tendencies are developed, united and fixed. We shall find analagous facts for guides in these things in close observation of all plant and animal life. Races improve in reproduction solely through improved conditions in the parent life, and through proper unions of strength and quality. We cannot attend too carefully to these conditions in the culture of all living things over which we have control; for there is abundant evidence of the certainty that every mood of the parent life is liable to transmission to succeeding generations for better or for worse.

Mr. Saunders, at Washington, told me of two interesting experiments that he had made some years ago. Wishing to fix the strong upright stem and other vigor of the Fillmore strawberry upon some new plant having a better berry, he fertitized the Fillmore pistils with pollen from one of the black varieties; he had forgotten the name of it, but probably it was the Black Defiance. Among the new seedlings was a plant having the very character he sought to produce; a plant of good foliage, the stem stout, holding its fruit clear from the ground, and the berry of excellent quality. The name given to the new plant was Patuxet. It was lost in the mud of the overflow of the Potomac into the Agricultural Department grounds, caused by filling up the old Washington and Georgetown canal, but Mr. Saunders thought some of the plants from its runners sent to A. M. Purdy, of Palmyra, New York, may have been preserved.

The other experiment was with raspberries. Doolittle black cap blossoms were fertilized with pollen from the Philadelphia red, and among the seedlings was this remarkable variation: a raspberry bush of the black cap form, bearing red berries like those of the male parent. This was also buried in the mud.

The practical lesson from all of the facts should be often stated and reiterated : Choose for seed bearing the hardiest and thriftiest forms of best habits of growth, and when possible fertilize by hand with carefully isolated pollen from the sorts whose quality and season of ripening suit us best; never forgetting, however, that there must be as careful isolation of the pollen as of the pistils, and not expecting too certain results in every case ; for with the utmost accuracy and care in our work, nature will have her own way sometimes and get the better of our inclosures, and astonish us with new puzzles in reproduction; and more than this, perhaps, is the fact that we have always to deal with the forces of heredity and reversion as to previous mixtures of which we may know nothing whatever. G.

INSECTICIDES AND OTHER DESTROYERS OF INSECTS.

In a conversation at Philadelphia, with Elisha Moody, of Lockport, New York, he informed me that his firm E. Moody & Sons, nurserymen and fruit growers, had for two years past sprayed their fruit trees with London Purple, and they have no more trouble with insects. They use one pound of the purple to 200 gallons of water, and put it on with a hand pump worked from a barrel of the mixture in a wagon, driven about among the trees. As yet they have no better way of keeping it stirred up than to have a man stand by the barrel and stir it with a stick, but are experimenting with a mechanical contrivance for the purpose attached to the wagon wheel. They have 20,000 pear trees in one orchard. Their object in using the poison was to destroy the codling moth, spraying the trees when the apples or pears are about the size of bullets, when the calyx is upright and holds the poison long enough to destroy the larvæ before it penetrates the fruit, and while perfectly successful in this they found the curculio also had disappeared from their plum trees. "With us," said Mr. Moody, "the insect question is settled; I care nothing more about insects in our orchard, They can be easily destroyed at slight expense, and at a time too when the poison used does no harm to fruit or trees."

Prof. C. V. Riley, at the American Pomological meeting, exhibited a cyclone nozzle recently invented by him for the benefit of the public, to use in spraying trees. It throws an infintessimally small spray with great force all over and under the leaves and branches at once. He recommends a kerosene emulsion for general use as an insecticide, as it has the additional virtue of killing the scale insects which ordinary insecticides will not destroy. His formula is one quart of milk to two quarts of kerosene, churn seven minutes, dilute the butter with forty parts of water. For tree work he uses a bambo pole with rubber tube inside and the nozzle on the end. Common soft soap mixes well with kerosene, churn the same as with the milk mixture, and dilute the butter with rain water. This kills the red spider.

Dr. E. L. Sturtevant's experiment with hens in his plum orchard is described elsewhere.

Hon. William Saunders, at the U. S. Agricultural Department, explained to me in September last, a successful experiment in tobacco stems in dealing with the grape-leaf hoppers in his greenhouses. The stems were strewed upon the ground under the vines—occasionally sprinkled to keep them moist, and the vapor arising from the tobacco kept the insects entirely out of the premises. Prof. Riley says this vapor is less injurious to delicate plants than either the smoke or the liquid of tobacco. G.

THE TARNISHED PLANT BUG.

(Lygus lineolaris, beauv.)

BY PROF. S. A. FORBES, OF NORMAL, ILLS.

[From the Farmers' Review, Chicago, Feb. 28.]

There are few insects which are capable of greater mischief to the horticulturist than this, and not many whose average injuries reach a larger sum during the season, equally at home, as it is, in the vegetable garden, the fruit field and the nursery. It has hitherto seemed one of the most difficult to deal with on the books of the economic entomologist, and those who have had most experience with it have had least hopes of combatting it successfully, but some recent experiments, made with a view to arresting its ravages in strawberry fields, have resulted favorably, and I think that it can be brought under economical control.

DESCRIPTION.

It is a hemipterous insect, and consequently has a pointed beak, with which it pierces the tissues of the plants upon which it feeds, but cannot "bite," in the proper sense of that word. This is a fact, of course, to be borne in mind in discussing modes of attack upon it.

The adult, or winged form, is about a fifth of an inch long, by half that width, oval, yellow, or greenish yellow, and more or less striped or mottled with dusky brown. It is extremely variable in color, but the most constant marks are five longitudinal white lines on the thorax (often reduced to spots, which then occupy the front margin), a white y-shaped mark on the scutellum, which is sometimes broken into other white points arranged in a triangle, and a white blotch, tipped with black, near the end of the wing covers.

The young are much less variegated than the adult and more distinctly green. In all but the first stage they may be distinguished by the presence of five black dots upon the back, arranged in a pentagonal form.

HABITS AND LIFE-HISTORY.

The old bugs winter under rubbish upon the ground, emerge early in spring, cluster upon the unfolding buds of fruit trees, the fresh foliage of strawberries and other early vegetation, and there lay their eggs, old and young together, draining these succulent, growing parts of sap. The effect is to arrest the development of the leaves, and even to wither and kill them, so that in an infested nursery the young trees will look as if scathed by fire. There is considerable reason to suppose that these insects are often active agents in conveying the virus of the blight of the pear and apple from tree to tree by inocculation with the infected sap. The strawberry, the raspberry and the blackberry are all attacked, the first much the most seriously. The bugs pierce the young berries and suck the sap, thus causing in the strawberry, at least a part of that withering and knotty hardening of the berry known to fruit growers as "buttoning." The crop is often diminished from one-fourth to four-fifths in yield and value by this injury.

The potato, and other succulent garden vegetables, often suffer from the depredations of this insect; the leaves and tips of the stems withering and turning black under the punctures of its tiny beak.

There are at least two broods in a year, one maturing in May and June and another in July and August, and it is possible that there are still others subsequent and intermediate. There are four stages between the egg and the winged form, each corresponding to a moult, or shedding of the outer crust.

REMEDIES.

This abundant and widely distributed species, occurring on a great number of plants, and throughout nearly the whole season, one would suppose to be especially liable to destruction by natural enemies in great varieties, but, unfortunately, this does not seem to be the case. Although a very few are eaten by birds, no natural enemy is known to have any appreciable effect upon their numbers, but there is some evidence that wet seasons are injurious to them.

The wide-spread occurrence of the species at all seasons of the year, the great variety of plants, both tame and wild, to which it resorts for food, the rapidity with which it breeds and the activity with which it flies from place to place, make any other than restricted measures against it quite out of the question. That is to say, there is little use in trying to diminish its numbers at large, unless a general clearing up and burning of rubbish late in autumn, might possibly contribute to that end.

The attention of the orchardist and gardener, whose fruits and vegetables are threatened by this insect, must, therefore, be turned rather to measures for defending directly the crops endangered.

Four methods of procedure have been found effective. When on the twigs of trees, it has been proven profitable to shake the bugs off in the cool of the morning, when they are sluggish, into buckets of soap suds or into water upon which a light film of kerosene has been poured. A more rapid and equally effective method of capturing them is to sweep or beat the twigs or other parts of plants upon which they are gathered in the cool of the day with an insect net, occasionally inverting and shaking this over a bucket of water and kerosene. Two topical applications have been found deadly to them, one of them especially so. A single dusting with pyrethrum (or Persian insect powder) has been found sufficient to kill eventually every insect exposed to it. This may be used either mixed with ten parts of flour, or suspended in water and sprayed or sprinkled on the bugs at the rate of about fifteen grains of powdered pyrethrum to the pint of water. As this substance can now be had from the importers for about forty-five cents a pound, it is well within the limits of economical use for the protection of horticultural products.

The kerosene emulsion, made by a thorough churning of equal parts of kerosene and sour milk until a permanent cream is produced, is almost, but not quite equally efficient. For use, it should be thoroughly mixed with ten parts of water and sprayed or sprinkled on the plants.

A full and elaborate account of this insect, illustrated by figures of all its stages will be given in the forthcoming report of the state entomologist of Illinois.

PROF. BURRILL AND MR. PEFFER ON BLIGHT.

In the Horticultural number of the *Farmer's Review*, of Chicago, published February 28, 1884, is an article on Blight, by Prof. T. J. Burrill, of the Illinois College of Agriculture, in which the immediate and active agency producing the disease, that which causes the changes in the tissue of the wood and bark, is described as "a living, self-multiplying organism classed among the *bacteria*, or, as often inappropriately called, 'disease germs.' "

Professor Burrill says: "There is absolutely no doubt of the truthfulness of this statement. Hundreds of persons have seen the destructive little things through microscopes of high powers, and wherever the apple and pear blight is in progress they can always be found in great numbers. The disease is easily produced artificially by inoculation—taking the organisms from infected trees and putting them in the living bark of healthy ones, by the aid of a pointed knife or needle. When thus introduced the bacteria destroy the contents of the living cells without attacking the cell walls; a kind of fermentation is set up and the part is killed. In the meantime the bacteria increase prodigiously in number and gradually spread to the surrounding cells, passing through the structure by means of their own, rather than carried by the movements of the sap. Progress is always slow, rarely more, under the most favorable conditions, than half an inch per day (twenty-four hours), in young growth—much slower in older bark. In the trunk of one apple tree, carefully watched after an inoculation, in June, the organisms remained in an active state eleven months and only spread during the time four inches.

After noting the fact that certain varieties are less subject to blight than others, and that certain soils and exposures are more favorable than others to resist it, he recommends remedial efforts to exclude the bacteria from the trees: "It must be understood that the disease always starts in some part of the top of the tree, never in the roots; and the disease agents come from without, never from the inner tissues. On the stigma (end of pistil or young pod) of the flower they enter the cells without the necessity of a wound, for there is no protective covering here like the epidermis or bark. Whenever, however, the living cells are covered by a coating of corky tissue, like the dead outer bark, or by an unbroken epidermis or skin, the bacteria can not gain entrance without mechanical help in the way of a crack, a puncture, or other wound. Though the disease is readily transferable by inoculation, no results ordinarily follow tying a badly blighted limb among the branches of a healthy tree."

Hence if his meaning is understood correctly, if there is no rupture of the bark by a diseased condition of growth, or by outside injury, no openings made in the cell structure, the bacteria cannot enter except through the blossoms as above stated. The first remedy, therefore, as recommended by Professor Burrill, is to maintain a healthy, constant, but moderate growth of the tree, especially in the early part of the season, that the wood may become well ripened and less liable to rupture from climatic causes. 2d. To prune early in the spring, before the buds start, if any pruning is necessary, and all wounds more than three-fourths of an inch in diameter to be covered with linseed oil and lead paint. 3d. To wash with a strong alkaline solution at least once a year to keep the bark smooth and clean, results useful in themselves, but especially useful in aiding us to detect blight in its first infection. 4th. To carefully remove all affected parts as soon as discovered, cutting far enough away from the discolored parts to make sure against inoculating healthy tissue by carrying the bacteria on the knife;

in fact he recommends using two knives in the operation, one in trimming off the diseased wood and the other in the lowest paring.

In a previous paper Professor Burrill has described the bacteria, if memory is not at fault, as being so small that 250 of them could stand in line across the edge of a sheet of writing paper. This being true, it is suggested that a safer rule is to paint or wax all wounds made in pruning, no matter how small.

MR. PEFFER'S VIEWS.

Geo. P. Peffer, of Pewaukee, in the same number of the *Review*, has an article upon blight in fruit trees, in which some other ideas are advanced, differing in part from those of Prof. Burrill. He admits that blight may ensue from either of the following causes: 1st. Pressure of sap through the stomata of the young leaves and new wood. 2d. Punctures by insects. 3d. Rupturing the cell structure by freezing and thawing; electricity or electrical conditions of the air; all these causing fermentation of the sap, inviting bacteria, and, when decay sets in, fungi. He admits the theory of bacteria to this extent, but finds another prevalent cause when no bacteria, in his opinion, are present; and that is in the early spring when the evaporating surfaces of the trees are largely increased by the opening blossoms and stimulated by high temperature. Then if there are stoppages in the wood cells, occasioned by any kind of injury to the structure of the newer wood or the last year's cambium layer, the upward flow of sap is interrupted, and the leaves and petals and all other surfaces of the blossoms dry up and wilt for want of moisture from below to supply the waste by this excessive evaporation. The leaf turns dark and finally black, the rotten sap or poisonous fluid runs down the petal to the calyx, along the little apple, then the stem of the little apple to the base, where all the fruit stems started out of the flower-bud, and then all are affected, if they had not been before. On most of the apple trees it only runs down to the old wood and stops there, while on crab or pear it is apt to run down the older wood, and so extend until the tree is killed. Here Mr. Peffer thinks is a case where the bacteria or fungi are not the cause, though they may set in as soon as fermentation and decay begin, and aggravate the disease.

"A few years ago," says Mr. Peffer, "we experimented on apple blossoms, and observed that the petals on the flowers wilted during the day when the trees were about in full bloom, but before they would naturally drop off. (We had at the time a southwest wind, and the thermometer ranging from 90 to 96 in the shade). They did not recover or straighten out during the nights, and we found on close examination they were scalded or burned, as it were, and in a few days looked like fire had run through them, from this blight.

Trees that had no blossoms open, or had no blossum buds to open, were not in the least affected neither then or during the summer—only those that were all out in full bloom on those three hot days perished.

It looked to me, then, that so much surface of so much bloom and leaves were not supplied fast enough with sap, to allay the evaporation going on during the time, to keep the petals from wilting or scorching."

He recommends two remedies that are substantially the same as Professor Burrill's, namely: 1st. "Remove the affected parts as soon as possible by cutting off the limbs a little below the colored sap under the bark, or cut off where it is sound and healthy, and immediately paint or wax the wound. 2d. Mulch the ground under the tree or have a crop of clover or grass, or any other crop that will shade the ground, thereby controlling sap circulation," but adds another: "Plant trees when quite small, or better still, plant your seeds where you want your trees to stand, so the main roots will go down deep into the subsoil, thereby retarding and equalizing the new wood growth, so that a sudden change of air will not stimulate overgrowth. This mode is particularly advisable for planting the pear. G.

THE OBJECTS OF THE STATE EXPERIMENTAL FRUIT FARM AND WHAT IS BEING DONE.

The chief object to be obtained is the development of long keeping apples, as hardy in tree as our most hardy iron-clads—the iron-clads all being summer, fall, or early winter. And it is with pleasure I relate the success thus far attained in the development of the objects sought.

We began work on the State farm five years ago the 20th of last April. We had to clear the land of a dense growth of timber; then plow, plant, and fence; all of which was done by the evening of the 6th of May—762 crown and root grafts set. For we had no trees of the variety we wished to set in the orchard, and so used root and crown grafts, worked on one and two year old seedlings, and set a stake to each to mark its location. The stand was good except where the ground was hot from the burning of brush and logs. And so good the growth and so soon into bearing that if ever I was going to set another orchard I would prefer root-grafts to three year old trees, as they would be about as large in five years as the three year olds, and no black-hearts from the back-set of transplanting, as is often the case with large trees. From this orchard we have gathered two crops of apples, about eight bushels each, aside from what was stolen. The apples were cut and seed planted, and from these we have now a good stand of one year old trees, which will be ready for delivery in two years more. And then the Regents of the State University will say what disposition will be made of them. I grow the seedlings until three years old, then select such as bid fair to produce good fruit, and send out as directed by the Regents.

The experimental orchard is for the growing of seeds, from which to grow new varieties that will stand our climate, and of best possible quality—mainly long keepers, and the way we expect to do it is by cross fertilization of such long keepers as we can make stand long enough to produce one crop or more, with our most hardy, such as we term iron-clads. This cross-fertilization is done when in bloom, by the flow of pollen from the bloom of one variety into that of another, thus causing the seed of the apple that comes om that impregnated bloom to produce a variety differing to a greater or less extent from any variety in the orchard. With us no two seeds from the same apple ever produced fruit or trees exactly alike, so varied are the degrees of crossing; even in the same bloom, no two stamens are fertilized exactly alike, therefore no two seeds will produce alike, for each seed has its own stamen.

And to make the crops more certain we plant the trees close together, about eight feet in the row, and the rows twelve feet apart, and every alternate tree a long keeper, the iron-clads between, thus making it easy and sure for a natural flow of pollen to fertilize each bloom to a greater or less extent, and then to save the seed from the long keeper, we are sure of some seedlings that in hardiness of tree will partake of the iron-clads, but in time of ripening the seedling will follow the parent apple from which the seed was taken. Such at least, are facts so far as our experimentations have developed, and we have had about a thousand seedlings in bearing, and only in three instances have they varied over three weeks in time of ripening from the parent apple from which the seed was taken and those three only from four to six weeks, though the crop was often made with varieties differing widely in seasons of ripening. To begin we had no data from which to start. It was test and try, solve our own problems, as to what to use and where to get it, and how to use it afterwards. And now with a good selection to start with and a knowledge how to use it, we are fairly started in a pursuit for more and better, and the past is a guarantee that our most sanguine hopes cannot prove a failure. That all the seedlings will prove hardy is not expected, nor is it expected that all the hardy ones will produce first-class apples, but we anticipate a better yield of good varieties than ever had before, from the fact that none but good varieties are set in the orchard; nothing there to adulterate as was formerly the case.

But it may be asked, why not all the seedlings prove good? In answer I would say, our iron-clads are all a mass of mongrels, the good are a selection of the best from a promiscuous mass of crosses, and inherent in the nature of all mongrels is to run back to originals, hence under the most favorable circumstances there will be more or less running back toward the original Siberian crab in fruit as well as in tree. In fact the hardness of the crab tree is what we want in the cross, with the size and quality of fruit of the best of our choice large apples, with just enough of the commingling of the crab qualities to gve a peculiar lusciousness. whether to eat from hand or in sauce, that no other apple has. Therefore not far distant in the future we anticipate a full supply the year round for the Northwest, and of better quality than any yet on the list. The Wealthy was from the seed of the Little Cherry crab, an accidental cross with some larger apple, getting the hardiness of tree from the crab, and the size of fruit from the large apple, and in quality, a commingling of the best qualities of the two.

Certain the Wealthy when made into sauce, it is crab, and not surpassed nor equaled by any except some of our crab crosses. Hence our unwavering faith that still better may be produced by the process of crossing and recrossing, ever retaining the best, and culling out the more inferior.

We once planted seed from a crab tree that was surrounded by Blue Pearmain trees that were in bloom at the same time of the crab from which the seed were taken. and the result was no two exactly alike in tree or fruit in a lot of 250. Some showed Blue Pearmain in tree and leaf, yet hardy as a crab, whilst others were crab in tree and leaf, yet occasionally one too tender to stand a hard winter. the fruit varying in size from large to very small and from first-class to worthless, regardless of size. And later we grew another lot of seedlings from the same tree, the surroundings not so good, the Pearmains having died in the time, and not one in ten proved hardy, and not one of the hardy ones produced a good fruit, showing that a good cross in the apple, like in all else, is sure to tell for good, and accordingly the selections were made for the State orchard, and they who get the trees will chance of something new and nice.

Then aside from the seed growing orchard, we have another on the State grounds of about 500 trees, set with choice seedlings to stand until they bear fruit, to see what the fruit may chance to be, and from it we anticipate something extra.

Also have a pear orchard that at one time contained about 500 trees—less than 100 left, and the success of those not very flattering, yet I have hope of successful pear culture in Minnesota, but that hope is in the Russian pear that I am getting from the Iowa experimental grounds. They have stood without the loss of a bud where our most hardy ones, side by side, same age, killed to the same snow line, and with those Russians I shall refill the grounds in full faith of success; and also anticipate setting another apple orchard on the grounds, composed entirely of Russians from the Iowa experimental grounds.

The grapery on the State grounds contains about 2,000 vines, mostly in bearing, comprising some 50 varieties; and from seedlings, from seed of our own growing —some first quality, but a large majority worthless.

And of the raspberries on the State grounds, the Gregg and Cuthbert do the best. The Turner is not there, but on our own it is all that could be desired in a berry—a luxury that every family should have.

Of strawberries we have a great assortment, and another year can say better than now what is best.

PETER M. GIDEON.

Excelsior, Minn. Dec. 18, 1883.

REPORT OF DELEGATE TO THE MISSISSIPPI VALLEY HORTICULTURAL SOCIETY.

Mr. President and members of the Minnesota State Horticultural Society:

Through your kindness I was made a delegate to the meeting of the Mississippi Valley Horticultural Society held at Kansas City, Missouri. With me the trip was one of pleasure, honor and usefulness combined, for which I shall ever feel under obligations to our own State society, that I have ever taken such an active interest in.

Between here and Kansas City lie hundreds of miles of rich and beautiful country, checkered with railroads in all directions, with hundreds of flourishing villages and towns, with fine school houses and churches, which express more than words the morals and enterprise of the inhabitants.

Missouri is the handsomest country I ever passed over; abundance of good timber and water, and good soil; a climate that grows corn, sweet potatoes, apples, pears, cherries, peaches and grapes in great abundance. In the middle of the winter no snow on the ground; sheep, cattle and horses getting their living on blue grass or feeding in the stock fields; hogs fat from following the cattle or eating what was left in the corn fields. A live true-blue yankee in *time* would become indolent and lazy in a climate like this.

Kansas City is a live place, greatly favored by railroads and by steamboat navigation. Situated in Jackson county, Missouri, at the junction of the Kansas and Missouri rivers, she has a large trade in hogs, sheep and cattle, also in apples.

The members of the society were well entertained at the hotels at $2 per day. Twenty four states were represented at the meeting. It was the most intelligent gathering I ever attended. The papers and discussions were all first class. A paper was read by ex-Governor Robert G. Furnas, of Nebraska, giving a description and estimate of the timber west of the Rocky Mountains, which was listened to with much interest.

A very important paper from Prof. J. L. Budd, of Ames, Iowa, was read: "The Fruits and Climate of Northeastern Europe," which showed conclusively that from that section of country we can get good varieties of cherries, plums, pears, and apples that will stand in this country.

A paper on strawberry culture by J. H. Hale, of South Glastonburry, Connecticut, attracted much attention, especially for its treatment of the subject of the blossoms.

"The Trunks of Apple Trees," a paper by Prof. T. J. Burrill, of Champaign, Illinois, took the ground, from the form and position of sap cells, that if the wood was ripe no fear need be entertained of the cold killing the trees; further that drouth and bacteria were the principal causes of the failure of orchards.*

Prof. S. A. Forbes, in his paper on insects affecting the strawberries, continued his valuable report in this line of research, so ably begun at the meeting of this society last year.

About forty papers were read on various and important subjects, and those that wish to read them can procure a printed copy of the proceedings of the society in full by sending $2 to the secretary, Prof. W. H. Ragan, LaFayette Indiana, It will be money well invested. The fruit exhibition was very fine. When my eyes rested on the long tables of fruit, the thought came to me, is it possible that Minnesota took the Wilder medal, with such a display of fruit as this to contend with—for here were the same men and fruit that represented Missouri at Philadelphia? But when the meeting was over and I had the privilege of sampling all the fruit the matter was plain. Missouri and Kansas can grow apples, pears, peaches, cherries and grapes in almost endless quantities, but Minnesota in quality and beauty of her fruit will come out ahead. Kansas and Missouri are natural fruit belts, but from some cause unknown to me, they do not grow the best varieties of apples, and I might add small fruits. Ben Davis, Geniton and Willow Twig are the leading varieties. The Baldwin, Greening and Bellflower are failures. The Thwack and Mammoth Cluster raspberries are the two leading varieties. The Cuthbert, our best in Minnesota, with them is a failure.

The best apple I found on the tables for long keeping, beauty and quality, was the York Imperial.

I procured cions of about twenty-five varieties of apples, new to Minnesota, for trial.

M. PEARCE.

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* Note on Foregoing Report.—Our delegate neglects to state that he got in his speech about ripe wood never winter killing, and about drouth in fall doing more mischief to fruit trees than cold winters, ahead of Prof. Burrill, and provoked the professor to inquire what should be done with a man who steals another's thunder. The inquiry was a high compliment to Mr. Pearce.

SECRETARY.

FRUIT REPORT FROM OLMSTED COUNTY.

CHATFIELD, Minn., January 11, 1884.

My orchard has made a satisfactory growth the past season: not more than two out of seven hundred trees have died. The location is a north-east slope, with clay soil, trees planted in 1876; cropped to corn and potatoes till 1881, then seeded to clover. Last year I pastured the orchard with about seventy hogs. This keeps the grass down, and leaves no shelter for mice; everything grown on the ground except the fruit is returned to it.

A history of my orchard may at this time be useful to the public. My trees were obtained from P. A. Jewell, with whom I had, in his day, many an evening's talk on fruit raising, and from whom I obtained some good ideas, which I have put in practice. The trees he furnished me were true to name, and not black-hearted. This was a good starting point. I set in new ground, after the first crop; distance twelve by sixteen feet. This is far enough apart in locations exposed to high winds. If the trees should prove to be too close in the future, one could go through the orchard after the manner of young George Washington and apply the hatchet to a few of the poorest, which would have paid for themselves many times over already, besides protecting their companions from many a stormy blast.

I consider my orchard as I do my live stock, the greatest reward from the best care; feed my trees as I feed my cows; have taken into the orchard an average of forty loads of manure per year for seven years. I could not now draw all the wood out in forty loads; besides it has already yielded me more than twenty loads of apples.

The Duchess is a perfect success. I had them last year perfectly sound till October. The Wealthy, though not so hardy, is doing well, and bears abundantly. I have a goodly number yet, which we find very palatable these cold wintry days and evenings. The Wealthy is an excellent fruit. The Walbridge we find in this part of the state about the same in wood as the Wealthy, though not so good a bearer when young; but we kept the fruit last year until May, and could have kept it till July, only the supply ran out; a very good pie apple then, not bad to eat, but rather too much acid to suit the taste of most people. The Minnesota we find not a good grower, but a good keeper. The Fameuse keeps well with us till February or March. The Orange we have yet in perfect condition, but it soon perishes when exposed to dry air. The Tetofski with me is one of the hardiest, but this goes to show that all trees are not alike adapted to the same kind of soil and treatment, as but few can raise them in this vicinity with success. Early Strawberry perfectly hardy, and a good bearer. Meaders Red Winter, if true to name, small, red, scabby looking fruit, tree hardy, but fruit no keeper; fit for nothing but cider or vinegar; used immediately from the tree in order to save it. Price's sweet, tender in tree, but fruit excellent; Beecher Sweet, *vice versa.**

I do not consider it necessary to go much further into details of the kinds of fruit in my orchard, as many of them are experimental as yet. I have no russets that are hardy, except one seedling; do not know how this winter may use it. I have several other very promising seedling apples yet on the trial list.

The prospect for a crop of fruit this year is good.

Now a word in regard to mulching fruit trees. In my opinion the time to mulch is when the ground is frozen enough so as to not easily thaw out, then the mulching will hold the trees in check in the spring, and save the crop from late frosts. Two years ago I am sure I saved two hundred bushels of apples by having my trees mulched, the blossoms being backward. One of my neighbors burned straw all night in his orchard, but did not save his fruit.

My trees were loaded with apples; his nearly bare; yet our trees were bought of Dr. Jewell at the same time; planted at the same time, on the same slope, the orchards being not more than forty rods apart. He was fully convinced that my mulching saved my fruit. I do not pile up near the trunks of the trees as many do, but spread the manure around three or four inches deep and four or five feet away from the trees. I keep it solid. as well as the snow, by tramping, so as to leave no soft places to harbor the mice. Have never lost a tree from the mice. In plowing in the fall, the earth is thrown up to the trees, so that they all stand on ridges. This prevents the accumulation of water around the trees, which I think in many cases is the cause of the bark cracking at the ground, and killing the trees. In such cases the injury comes from the water running in and freezing in the vacant space left around the tree just below the surface of the ground, caused by the swaying of the tree to and fro in the wind while the tree is young and not strongly rooted, the freezing of the water swells it and bulges the bark loose, which is sure death to the trees. Some people fail to see the cause of injury here, because there is life enough left to start the sap upward; the buds swell; the trees leave out; but then they sicken and die in midsummer, and the fault is laid to the trees themselves, when it was only in the management of the orchard. One cannot be too careful in setting; and after setting we cannot be too careful out here on the prairie to prevent the wind moving the trees back and forth; not only because of the danger from ice in the winter, but from the dry air getting in among the fibrous roots and killing them by drouth in the summer. We should look at our young trees often in the summer, and if we find these vacant spaces around the trunks, caused by the trees swaying in the wind, fill them up, and keep out both dry air then and ice in the winter.

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*Probably not true to name, for Beecher Sweet is both hardy and good.—SECRETARY.

My wife tells me to say one good word for the Meader's Winter; that it is the best apple we have for jelly—juicy and tart—just right.

I am sorry not to be able to meet with the State Horticultural Society. As I am alone on the farm, it is not always possible to go away. But I am interested in the proceedings of the society, and hope what I have written may be accepted in lieu of better services which cannot now be tendered.

J. D. RINDERKNECHT.

WINONA COUNTY FRUIT REPORT.

STOCKTON, January 8, 1884.

So far trees, plants and vines seem in good health for a crop of fruit this year. The apple crop of 1883, was not very large, still what was raised brought good prices; Wealthy being sold for $2 per bushel, in a small way, as but few are yet raised. My own orchard being young I raised but little fruit and what there was, was mostly whipped from the trees by the wind at the time of the Rochester tornado. I had several seedling apple trees with few apples on for first time, but the storm seemed to have a spite on them, so I cannot say how good or how bad they were, but think the good was ahead. I have been around to the different orchards near me and as a general thing they show neglect. To the careful, energetic fruit grower I can see a bright future. Who is to reap the harvest if no sower sows the seed? Surely the demand for prime fruit is far ahead of the supply. Some say that they will sow one acre to grain and take the proceeds and buy Michigan apples year by year; but what if our Michigan friends fail to raise fruit to spare? My response is, as a Michigan friend told me last spring, "Minnesota can, does and will raise better apples than they do south and east of us. But it takes work to do it."

For our county, Wealthy, Dutchess, Utter, Telofski, Fameuse, Golden Russett, Talman Sweet, Red Astrachan, Orange, Transcendent and Hyslop seem to take the lead. Of grapes, Concord, Delaware and Janesville. Of raspberries, Turner, Philadelphia. I am experimenting with Seedling black caps. Have one very good one. One of the best to can and will prove a No. 1 in *all* points, I think. Its own seedlings seem to be good, also so far as trial. As to strawberries, with me Capt. Jack, Crescent and Green's Prolific, pay best; while in the valley below me Capt. Jack is prone to run too much to vine. Hart's Minnesota leaf-blights. So we must plant what does best on our own soils. Have not seen any insect enemy on the strawberry plants in our vicinity.

Of twenty kinds of potatoes on trial in 1883, I like Rural Blush, Late Beauty of Hebron, Tioga, American Giant, Manhattan, Early Ohio, Belle and Bliss Triumph, the best. I have a white sport of the Manhattan of my own raising, which on one year's trial seems good.

Gregory's Danvers Carrot and his Early Red Globe Onion were splendid.

W. K. BATES.

FRUIT REPORT FROM HOUSTON COUNTY.

The fruit crop of last year in Houston county was unsatisfactory, and the season will long be remembered for its many peculiarities. Apparently fruit trees and plants entered upon the last winter in the most favorable condition, and the soil although not saturated with water was not dangerously dry. Winter set in about the 7th of December, when the thermometers marked 20° below zero, and continued below two or three days. This was followed with fine weather, frequently above the freezing point, until the 31st, when the mercury decreased to 10° below. During the following sixty days the thermometers indicated below zero the greater part of the time, and more than once from 20 to 30 below.

The snow fall was of unusual depth and remained upon the ground until April The spring following was cold and backward, and marked by frequent frosts until near the first of June. The snow disappeared gradually without rain or the usual spring freshets, and potatoes that were not dug in the fall survived the winter unharmed. The destruction and injury to fruit trees was considerable in many orchards, and more especially in valleys and upon low lands in sheltered localities. In some instances the hardiest varieties were injured as much as the more tender, and the greatest fatality was to trees set the previous spring. I should estimate the permanent damage to the trees about fifteen per cent. and the killed outright about six per cent. Upon elevated ridges the injury was the least.

There was a general blossoming of all of the orchards, and even trees that soon after died outright, put out leaves and bloomed. The bloom of apple trees generally was not as plentiful as the previous year, but enough for an average crop of fruit. Several frosts occurred in May, and a severe one upon the morning of the 21st, but a careful examination did not show the immediate damage to be very great. The fruit set liberally and commenced enlarging, but early in June many trees began to present a sickly appearance and upon some varieties a large proportion of the fruit prematurely dropped, and that which remained to ripen were generally inferior to other years. The fruit was unusually exempt from the codling worm, but the injury by the apple curculio was greater than ever before noticed, and by fall there was but a small percentage of perfect apples left for the grower. I estimate that upon my place seventy-five per cent. of the Duchess and Willow Twig were punctured, some of them so badly as to be hardly recognizable, and unless some means is found to head off the Little Turk, the growing of the Duchess and Willow Twig will have to be abandoned. The varieties that produced the most fruit were the Early Strawberry, General Grant, Orange, Hyslop and Transcendent crabs, and the Duchess Tetofski and Cooper apples. The Walbridge, St. Lawrence, Talman Sweet, Fameuse and Plumb Cider fruited very heavy the previous year, and we did not expect a large crop from them.

Strawberries did not average more than two-thirds of a crop upon the best beds, and some plantations were nearly a failure. They wintered well, and promised for a time to be the heaviest crop ever grown here. The earliest settings were blackened by the frost of May 21st. An unusually heavy rainfall in June greatly damaged the remainder. Gooseberries and currents were much less than an average crop. Raspberries, the Doolittle were a little more than a half crop; the Gregg about one-fourth; Turner, about two-thirds.

Had the grapes all ripened, there would have been about three-fourths of a crop of Concords; the Delawares not more than half a crop. The Rogers and Delaware suffered from rot and mildew.

The first grapes to ripen were fifteen days later than usual, and twenty-five days later than in some seasons, and in many places the entire crop was destroyed by the early frosts. The September frosts did not injure the vineyards along the Mississippi river, so that about 60 per cent. of the crop was secured.

The crop of native plums, both in quantity and quality, was the worst ever known here. I am testing the Worden and Moore's Early grapes, and find the vines as hardy as the Concord; the fruit as good and a few days earlier in ripening.

I believe the Janesville to be valuable where the Concord will not ripen.

There are growing in this county:

Apple trees, growing, (1862)	24,745
Bearing trees, bearing (1882)	11,629
Bushels of apples produced in 1882	1,234
No. grapes vines bearing in 1882	58,859
No. lbs. grapes produced in 1882	45,243
No. vines bearing in 1883	86,099

During the summer I have visited orchards in various parts of the state and have not found any locality where the trees were injured more severely than in this county and generally the crop of fruit produced was better in proportion to the age and size of the trees. The Siberians, Duchess and other varieties were larger and fairer in the counties west of us for 200 miles, and by examination made I find the trees were less injured last winter.

JOHN S. HARRIS.

LaCrescent, Minn., Jan. 1884.

GENERAL FRUIT REPORT FOR ROCHESTER DISTRICT.

We think we have two good reasons for not making a very favorable report for this station, viz: 1st. It is what is pretty generally conceded to be the off year in fruit culture. 2d. You probably learned that on the 21st day of August we had what is called a tornado. This took the most of our fruit off before it was fairly matured, and had it not been for our early Russian varieties, the most of which were ripe at the time of the tornado, we should have been in much worse condition. We fruited one hundred and three varieties in all, including forty Russian sorts. The best bearers of summer were Duchess, Early Champagne and Tetofski; fall, Wealthy, Hass and Cooper; winter, Rollins Pippin, Elgin Beauty, Pewaukee.

R. L. Cottrell sold fruit to amount of $225, a good showing for 1883, but not equal to 1882. E. B. Jordan is one of the most extensive fruit growers in the state, but we have not been informed as to the number of bushels produced. We understand that he sold fruit to the amount of $3,000, the past season. M. W. Cook, $900; M. J. Hoag, $790; E. Leonard, $300. There was a large amount of fruit raised in my senatorial district, but I have not had time to gather in the statistics. The strawberry and raspberry crop was all the most selfish natures could ask for. Gooseberries and currant crop but moderate. We fruited this past season for the first, a new seedling raised from the Houghton by W. O. Crittenden of Dover. The fruit is a size larger than its parent, and we think better in quality. We think it bids fair to supercede both the American and Houghton seedling gooseberry. Owing to early frost grapes were almost a failure. A. W. SIAS.

Neglected to state at the proper place that the Wealthy stands head and shoulders above all other early winter varieties, and that Wm. Somerville, one of our most successful fruit growers, says he has raised fifty bushels from one hundred trees, six years old. A. W. S.

FRUIT REPORT FROM THE OWATONNA DISTRICT.

The past season has been a very trying one to the fruit interests of this section of the state. And the question of variety was never of more vital importance than at the present time.

Heretofore we have had hopes of several varieties of standard apples, but now we have come to regard the Tetofski and the Duchess as the only well known varieties that can be planted here with a fair prospect of success. With the former this did not seem to be the bearing year, whilst the latter would have produced a good average crop but for the heavy wind of July 21st, which almost entirely destroyed the fruit and ruined many trees.

Our worst fears are being realized in regard to the Wealthy. On account of its early bearing and magnificent fruit we had hoped until quite recently that it would at least pay the cost of cultivation, but its dying proclivities seem so great that we have resolved *to plant no more.*

The crops of crab apples and plums were very materially diminished by a severe late frost. And it may be regarded as a singular fact that they are more susceptible to injury by late frosts than Duchess and Tetofski.

We hear of winter seedling apples scattered over the country, and there can be no doubt that the liberal premiums offered by our society will bring out something of great value to our state.

Many varieties of crab apples which have been highly recommended are worthless or nearly so to me in orchard. And I am the more confirmed in the opinion that no variety of apple or crab should be recommended by our society without *thorough*, *varied* and *prolonged* orchard tests. And that our apple and crab lists would become more reliable if a greater number of orchardists widely dispersed and fewer nurserymen were engaged in their revision. Not that nurserymen are less trustworthy, but they sometimes fail to see the true inwardness of the stock they have to sell.

Small fruits have been nearly a failure—strawberries producing hardly half a crop, with Crescent at the head for profit; and grapes usually failed to ripen before frost.

I very much regret that facts do not warrant me in making a more cheering report at the present time, but I promise if I live a hundred years I will do my level best to help beat the elements and make Minnesota a No. 1 fruit State.

E. H. S. DARTT.

REPORT OF SEEDLING FRUIT COMMITTEE.

During the last year I have spent considerable time in looking up seedlings and new varieties of fruits with a view to finding such as may prove hardy and worthy of propagation and dissemination in this state. It being an off year for fruit, I am not able to make a very definite report upon the value and quality of some of the varieties. One of the trees of Wm. F. Dunbar, of Caledonia, Houston county, mentioned in my report for 1883, appears to be about as hardy as the Duchess, fruit of medium size, a good keeper, but No. 2 in quality. The tree of Philip Everhard, of Mound Prairie, Houston county, which produced thirty bushels of apples in 1882, stood the test of last winter and bore some fruit in 1883. The fruit is not No. 1 in quality, but as good as most of the Russians; is about the size of the Fameuse, and keeps well. J. C. Kramer has several varieties, the trees of which appear to be hardy. They bore but little last season, and he informs me that the fruit was not as fair as usual. Some four varieties of them are upon exhibition at this meeting. I found several seedlings still remaining in apperently good condition in the orchard formerly owned by Mrs. Campbell, Minnesota City. One variety of sweeting strikes me as being of superior quality and worth looking after. James Wright, of Minnesota City, has one tree thirty-one years old and over one foot in diameter that has never been injured by winter killing or blight, and is a regular bearer of a fruit that in size, shape and color somewhat resembles the Bellflower. Some of the specimens are perfect pear shape. The fruit is a fair keeper and valuable for cooking purposes. Mr. S. Bates, of Stockton, has one or two promising varieties which he has agreed to show at this meeting and report upon. I have located other trees in various parts of the state, and should the coming season be favorable for a crop of fruit, I hope to find something worthy among them. Of the Rhodes Seedling, of Trempealeau county, Wisconsin, Mr. Wilcox writes: "The seed from which this variety originated was planted by Mrs. Rhodes while a maiden, some twenty-eight years ago. The tree is standing in a burr oak soil, land level, and other apple trees, not only on Mr. Rhodes' place but for miles around, except crabs and Duchess, are not a success. It is not subject to blight, has borne twenty bushels a year, as is claimed, for several years." He says: "I helped to measure it last July and found the trunk near the ground five feet in circumference and the spread of the top 37 feet in diameter. It is also well adapted as a stock for top-working Fameuse, Utter, etc." He further says: "We are trying in orchard many seedlings, among them two from De Soto, one from Dodge county, Minnesota, and some from this county. I found one promising looking tree at Mr. Dartt's, and several in Olmsted county which I expect Mr. Sias will report upon." From the result of observations made I am led to believe that we are on the right track, aud that we shall yet find or originate varieties that will fill the bill. JOHN S. HARRIS.

La Crescent, Jan. 16, 1884,

REPORT ON SEEDLINGS.

Webster says: "Caution is the armor to defend us against imposition and the attacks of evil." And after being most outrageously imposed upon for the last quarter of a century by people palming off varieties that would not stand even 60° below zero, I thought it about time to be a little more cautious, and so concluded to take with me hereafter the very best counsel to be obtained in the state, when looking up new seedlings. With this new departure in view, last September, I invited our worthy President, J. S. Harris, to accompany me to the township of Haverhill to see some seedlings that had been highly recommended on the farm of Peter Brook, but the President after examining them closely for a sufficient length of time, failed to *enthuse* worth a cent, and so we returned home sadder, and probably not much wiser, on the apple question. But if not out of order here I will simply state that on our way home we passed a most successful seedling hedge of Buck Thorn, *Rhamnus Catharticus*, on the fine farm of A. Welch.

November 17th, on invitation, Mr. Wm. McHenry, of St. Charles, accompanied me to examine the seedlings of Robert Waldron, of Cascade, Olmsted County. He knows a good apple when he sees one every time. Am sorry to say Mr. Waldron was confined to his bed at the time, but he had the kindness to order up a fine dish of his new seedlings from the Fameuse, and we, as well as all who saw them at the Fair at Rochester, last September, pronounced them beautiful to look upon, and choice in quality; as to hardiness, I think they differ but little from the Fameuse, *possibly* they may be a little more hardy. Mr. Waldron also has, to make a rough estimate, some two miles of promising young hedge of the Buck Thorn Seedlings, lining the roads and lane to his pasture. Last month I examined a promising new seedling on the farm of Mr. Hart, of Dover Townshp. Mr. Hart was absent, and we failed to learn much about it, except that the tree was hardy. We did not see the fruit; we learned that it bore this last season, but the fruit was all stolen. Said to be green in color, season late fall.

Richard Porter was next invited to counsel with me on the Forster seedlings. He has handled more trees than most men of our county, and knows whereof he speaks. Mr. Wm. Forster resides in the township of Orion, Olmsted County, some 18 miles from our place. He is a pleasant gentleman, like all Minnesota fruit growers, and his wife and family are worthy of such a man. We had a very pleasant visit; was sorry to learn that Mr. Forster was too much out of health to attend this session. The wood of the Forster's Red Winter looks well; we have a specimen of this on exhibition and also of the Forsters Sweet. The fruit of the latter I suppose you have on exhibition, the other varieties did not bear much this season, and we did not see any of them.

Respectfully submitted,

Rochester, Jan. 15, 1884. A. W. SIAS.

NOTES ON THE FLORA OF WESTERN DAKOTA AND EASTERN MONTANA ADJACENT TO THE NORTHERN PACIFIC RAILROAD.[*]

BY JOHN B. LEIBERG.

[Read before the Minnesota Academy of Natural Sciences, March 4th, 1884, and published by permission of the Academy.]

While in the service of the Northern Pacific railroad company during the past year in the interest of tree culture, I had abundant opportunity to examine the interesting and to some extent peculiar flora of Western Dakota, and to a limited degree the eastern portion also, and the eastern part of Montana as far west as the Yellowstone river at Glendive, and to make large and full collections of the same. Copious and interesting notes were made respecting the botanical features of the region, and a few of the more prominent are presented for the consideration of the Academy.

The climate of eastern Dakota, in both rain-fall and temperature, does not appear to present any great variation from that of the prairie region of western Minnesota, except perhaps a somewhat longer winter. The climate of the western portion is very different. The summer is very dry; showers are of rare occurrence; and the temperature varies excessively. Thus in the month of July the mercury rose to 115° Fahrenheit, and fell to 32°. Such great variations cannot fail to modify plant life to a very great extent. The hot, scorching winds that generally accompany the high temperatures quickly dry up all vegetation, except along the water-courses. The extreme dryness of these hot winds is remarkable. During the great heat which prevailed in the early part of July, I saw the grass on the prairie, which was green and fresh as prairie grass usually is, completely dried up and converted into hay within a period of two hours. As a consequence of this dry weather, we find no annuals in summer. They only appear during the spring, while the ground is still moist. The perennials all have long root-stocks, which penetrate deeply into the ground and enable them to withstand the drouth effectually.

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[*] NOTE BY THE SECRETARY. It seems very desirable to gather full and accurate knowledge of the flora of the prairies and plains of this country, and eventually to compare these with the similar region in Russia where fruit culture is very successful, with a view to the selection of such varieties of fruit trees, and forest and ornamental trees and shrubs, for importation, as shall be adapted to the climate and soil of the Northwest. Much may be added to the stock of information of this kind, if those having opportunities for observation will communicate to the Secretary botanical and climatological notes, as in the following essay.

The surface of the country west of the Red river valley is more rolling than in Minnesota, and is found still more so as the Missouri river is approached. Numerous stony knolls and long ranges of rocky, pointed hills mark the ancient glacial moraines. The flora here shows plain indications of the proximity of the dry, treeless plains west of the Missouri; though at the same time the climate is humid enough to permit species of plants to grow and flourish, whose principal habitat is much farther eastward. Here and there alkaline pools appear with their peculiar plants, adding largely to the variety of the flora of this region. Many species are found whose home in the Southwest is at a high elevation, proving that as we go north the increase in latitude compensates for a decrease in elevation.

Scattered over the drift hills in great abundance, and the first flower to appear in spring is *Anemone patens,* L., var. *Nuttaliana,* Gray, attaining a luxuriance of growth never met with in Minnesota. After crossing the Missouri and the western boundary of the glacial drift, this plant wholly disappears. In the moist places of the prairies is found *Ranunculus glaberrimus,* Hook., and around alkaline ponds *R. Cymbalaria,* Pursh, the latter being very abundant west of the Missouri river. Another representative of this genus resembles *R. rhomboideus,* Goldie, but differs from that in its more erect and taller growth and much smaller flowers. It appears to be some undescribed species.

A *Draba,* probably *D. nemorosa,* L., is quite plentiful. Early in the spring, and flowering until late in the summer, we find *Vesicaria Ludoviciana,* DC. *Erysimum asperum,* DC., var. *Arkansanum,* Nutt., is abundant as we proceed westward, becoming a very conspicuous plant. Around the alkaline ponds grows a *Nasturtium*, near *N. sinuatum*, Nutt. It may prove to be only a variety of this species.

Cleome integrifolia, Torr. & Gr., which is found here and there in Minnesota as an introduced plant, is first met with in its indigenous state in Pyramid Park near the Little Missouri river. There also, and nowhere else in the territory under consideration, *Cleome lutea*, Hook., was observed. *Polanisia graveolens*, Raf., was frequently noticed along the water-courses, differing somewhat from its character in Minnesota, in having a more clammy pubescence and longer and more turgid pods.

Viola Nuttallii, Pursh, was met with abundantly, but does not extend to any great distance west of the Missouri river, and was not observed east of Jamestown. *Viola cucullata*, Ait., was not rare in the region covered by the drift, but was confined to the borders of the numerous small ponds.

A Cerastium and two species of *Arenaria*, not determined, were very common. One of the Arenarias was met with only on the top of the buttes west of the Missouri, forming dense tufts, the short stems closely covered with small rigid leaves giving it a spiny appearance.

A rather common and showy plant was *Malvastrum coccineum*, Gray, the only one of the *Malvaceæ* seen.

Two species of *Linum*, *L. rigidum*, Pursh, and *L. perenne*, L., were found. The latter grows very rank, with showy blue flowers, often more than an inch in diameter. The seed-vessels were observed later in the season, and were found to be nearly as large as in the cultivated flax (*L. usitatissimum*, *L.*), with seeds about half as large, of a shining dark brown color, and apparently containing a considerable proportion of oil. The question arises, whether this wild flax could be improved by cultivation so as to equal in fiber, if not in oil, the *L. usitatissimum*. It is well worth experiment to determine these points, more especially as it is a perennial, while the cultivated flax is an annual.

Polygala verticillata, *L.*, and another species of which no published description could be found, were frequently collected west of the Missouri, extending into Montana.

As might be expected, the *Leguminosæ* were well represented, but a lack of authorities and published descriptions prevented full and complete determinations of the many interesting species collected. Fourteen species of *Astragalus* were observed, among them

A. simplicifolius, Gray, and *A. triflorus*, Gray. The former was observed only in Montana, on the hills between McClennan and Hodges stations on the Northern Pacific railroad. *Psoralea argophylla*, Pursh, *P. esculenta*, Pursh, and *P. lanceolata*, Pursh, were noted. The latter possesses the peculiarity of forming at maturity a perfect joint on the stem near the ground. A light wind will then cause the plant to break off and go rolling along in the same manner as happens with *Amarantus albus*, L. (commonly called "tumble-weed") on the prairies of Minnesota. *Psoralea argophylla* and *esculenta* also break off near the ground, but do not appear to form a distinct joint. The separation in these species is effected by means of a constriction on the stem, which cuts off, as it were, the nourishment from the root, and causes the stalk to shrivel at that point, when the least touch or gust of wind releases the plant. On the hills near Mandan, and in no other place along the route, *Petalostemon macrostachyus*, Torr., was collected. Here also *P. villosus*, Nutt., was quite abundant. *Amorpha fruticosa*, L., and *A. canescens*, Nutt., were both well represented, but a little farther westward they were largely replaced by *A. microphylla*, Pursh. *Oxytropis*, *Desmodium*, *Vicia*, *Lathyrus* and *Hosackia* were found in abundance throughout the territory. *Lupinus perennis*, L., was met with in the valley of the Green river; also an apparently undescribed species of this genus was collected.

Eleven species of *Potentilla* were collected, among them *P. Pennsylvanica*, L., and *P. fruticosa*, L., the latter nowhere except in Pyramid Park. Only one species of *Prunus* was seen west of the Missouri river, namely, *P. pumila*, L. Growing abundantly on the rocky buttes was *Chamœrhodos erecta*, Bunge. So far as I know, this plant has not before been referred to this region. Our most common species of strawberry (*Fragaria Virginiana*, Duchesne) abounds east of the Missouri, but is very infrequent farther west. The hot dry weather prevailing during June and July doubtless proves unsuitable for its growth.

A gooseberry (*Ribes)* near *R. Cynosbati*, L., of a low bushy form, thickly armed with long stout prickles, grows on the summit of the dry baked clay hills of western Dakota and eastern Montana. Although growing in these extremely dry localities, it was heavily loaded in the month of July with large ripe juicy fruit, possessing a sweet and agreeable taste. Aside from scattered patches of *Shepherdia*, this was the only native edible wild fruit that was observed along the route after crossing the Missouri.

Hippuris vulgaris, L., rare in Minnesota, is plentiful in every little stream west of the Missouri, provided it is not alkaline and contains water sufficient to prevent complete evaporation during the dry season.

Of the *Onagraceæ*, *Epilobium palustre*, L., and *E. molle*, Torr., were sparingly found; more common were *Œnothera cæspitosa*, Nutt., and *Œ. albicaulis*, Nutt., the latter extending as far as to Muskoda station east of the Red river. Much more rare was *Œ. Missouriensis*, Sims. *Gaura coccinea*, Nutt., was very abundant.

Three species of *Cactaceæ*, *Mamillaria vivipara*, Haw., *Opuntia Missouriensis*, DC., and *O. Rafinesquii*, Engelm., were plentiful. *O. Missouriensis* was first observed, in going westward, on the hills around Mandan.

The *Umbelliferæ* were mostly represented by species of *Peucedanum*, *Cymopterus* and *Musenium*. Of these only one, *Peucedanum nudicaule*, Nutt., extends as far east as Minnesota.

The *Compositæ*, as might be expected, were numerously represented. Species of *Liatris*, *Solidago* and *Bigelovia* were abundant. Asters were rather rare. *Helianthus lenticularis*, Dougl., (more correctly known as *H. annuus*, L., since it has been shown to be the original of the common cultivated sunflower,) was the only species of this extensive genus occurring at all plentifully west of the Missouri. *Lepachys pinnata*, Torr. & Gr., was wholly replaced by *L. columnaris*, Torr. & Gr., and its variety *Tagetes*, Gray. It is curious to notice the gradual transition to *L. pinnata*, as the Red river valley is approached. A number of species of *Artemisia* were noticed; among others *A. tridentata*, Nutt. (sage-brush), but not extending eastward much beyond Pyramid Park. *Senecio lugens*, Rich., var. *Hookeri*, Eaton, was common everywhere. Species of *Hieracium* peculiar to the far west were found; also *Grindelia squarrosa*, Dunal., which extends east into the edge of Minnesota. *Troximon cuspidatum*, Pursh, common in Minnesota, was replaced by *T. glaucum*, Nutt.; and *Iva xanthiifolia*, Nutt., by *I. axillaris*, Pursh. Two species of *Gaillardia*, *G. aristata*, Pursh, and an undetermined one, were collected. *Antennaria* was represented by *A. dioica*, Gærtn., a rather pretty little plant.

Aphyllon fasciculatum, Gray, of the order *Orobanchaceæ*, was very common on the dry hill-sides, parasitic on the roots of various species of *Artemisia*.

Numerous species of *Pentstemon* and *Castilleia* made up the bulk of the *Scrophulariaceæ*.

Only one of the order *Labiatæ* was collected west of the Missouri; this was a species of *Hedeoma.*

Three species of *Echinospermum*, one *Mertensia*, and three species of *Eritrichium*, were noted as representing the *Borraginaceæ.*

Phlox cæspitosa, Nutt., is first found in going westward near the Missouri river, but only on the summit of the highest and stoniest hills; farther west it covers the ground nearly everywhere.

Asclepias Cornuti, Decaisne, was supplanted by *A. speciosa*, Torr., a closely allied species, rather more handsome though not so tall and robust.

Among the rarer *Chenopodiaceæ*, I collected *Monolepis chenopodioides*, Moq., *Eurotia lanata*, Moq., *Sarcobatus vermiculatus*, Torr. (this only in Pyramid Park), *Salicornia herbacea*, L., and three or four species of *Obione.*

Among the *Polygonaceæ*, *Rumex venosus*, Pursh, and several species of *Eriogonum* were of frequent occurrence.

Shepherdia argentea, Nutt., and *S. Canadensis*, Nutt., commonly called "buffalo-berries," and *Elæagnus argentea*, Pursh, the silverberry, abounded along the streams.

A low trailing *Juniperus* was exceedingly common west of the Missouri, growing everywhere upon the sides of the dry rocky buttes.

Allium reticulatum, Fraser, two species of *Zygadenus*, *Smilacina stellata*, Desf., and *Calochortus Gunnisoni*, Watson, this last not extending east of Pyramid Park, and *Yucca angustifolia,* Pursh, make up the list of *Liliaceæ* noted in western Dakota.

Scirpus maritimus, L., was common around alkaline ponds, together with several undetermined species of *Eleocharis.* Numerous *Carices* were observed, mostly differing from Minnesota species.

The *Gramineæ* were much more sparingly represented than one would suppose to be the case. West of the Missouri fully half of the grass consisted of a single species, *Kœleria cristata*, Pers. The remaining half was divided between a dozen other species, such as *Aristida purpurea*, Nutt., an undetermined *Calamagrostis* near *C. stricta*, Trin., *Stipa Mongolica*, Turcz., and *S. viridula*, Trin., *Spartina gracilis*, Trin., *Brizopyrum spicatum*, Hook., *Bouteloua hirsuta*, Lagasca, and *B. oligostachya*, Torr., which two last commonly pass by the name of "buffalo grass," *Munroa squarrosa*, Torr., and *Buchloe dactyloides*, Engelm., the true buffalo grass, the last only occurring in scattered patches here and there. Several species of *Poa*, *Beckmannia erucæformis*, Host., *Schedonnardus*

Texanus, Steud,, *Eriocoma cuspidata*, Nutt., and several species of *Triticum*, complete the list of grasses collected.

Only two species of ferns were observed, a *Woodsia* and *Pellæa atropurpurea*, Link., the latter growing in the crevices of the rocky ledges on the summit of the buttes. A few mosses were seen, and two species of lichens.

The arboreal vegetation was, as might be supposed, very scanty. Aside from the timber on the Missouri river bottoms, only a few stunted willows, cottonwood, box-elder and Juneberry were found scattered at intervals along the streams.

A curious feature of the country west of the Missouri, beyond the limit of the drift, was the great number of fossil tree stumps, protruding through the sod. Hundreds could be counted in many places, and in some localities, especially in Pyramid Park, the fossil trunks were found where they had fallen, almost whole and but little the worse for the ravages of time. There is no doubt that during the Cretaceous and Tertiary periods extensive forests flourished in this region; and to judge from the size of the stumps remaining, some of the trees must have been of immense size. Many stumps were seen ten feet or more in diameter, and I heard of others still larger.

This region will yet prove a mine of wealth to the botanist studying our fossil flora. Fossil leaves in great abundance occur everywhere in the Tertiary sandstones and soft Cretaceous clays. In some places the clay beds were originally underlain by seams of lignite, which have been burned, baking the clay above into a kind of brown, red, or yellow brick, which shows perfectly the forms and venation of these fossil leaves. The region is well worth the time and attention of working botanists, both in recent and fossil botany; and will doubtless ere long receive its due share of exploration and study, since it has become so easy of access.

CATALOGUE

OF

APPLE TREES IMPORTED IN 1870

FROM

ST. PETERSBURG, RUSSIA.

BY THE

U. S. DEPARTMENT OF AGRICULTURE,

Cions of which have been distributed under the following numbers:

NO.	RUSSIAN NAMES.	TRANSLATION.
A 1	Astrachaner, Rother	Red Astrachan.
" 2	Weisser Calville, Sommer.	White Summer Calville.
" 15	Sussapfel von Toenarius	Von Tœnarius Sweet apple.
" 44	Astrachaner, Weisser.	White Astrachan.
" 54	Luikenapfel	Luiken apple.
" 60	Anasapfel, Rother	Red Duck apple.
" 61	Edler Rosentreifling	Noble Redstreak.
" 68	Champagner, Fruher	Early Champagne.
" 69	Sommer Birnapfel	Summer Pear apple.
" 70	Winter Birnapfel	Winter Pear apple.
" 105	Grafensteiner, Russischer	Russian Gravenstein.
" 122	Borsdorfer Revaler	Borsdorf Revel apple.
" 128	Schafnase	Sheepnose apple.
" 153	Skvoasnoi Nalin	Transparent Juicy apple.
" 157	Belui Nalin	Juicy White.
" 159	Limonoe	Lemon apple.
" 161	Langerfeldskoe	Longfield's apple.
" 162	Buschbon	Buschbon.
" 164	Polesatoe Heidorns	Heidorn's Streaked.
" 166	Aport Letny	Summer O'Porto apple.
" 167	Scholtoe Sladkoe	Yellow Sweet.
" 169	Sclenka Sladkaya	Green Sweeting.
" 170	Revelskoe	The Revel apple.
" 171	Stekliannoe Z. Simowoe	Glass Winter apple.
" 173	Skerospelka Rannaja	Earliest Early.
" 174	Pipka, Malaja	Little Pipka.
" 176	Krasnabakoe	Red-sided apple,

NO.	RUSSIAN NAMES.	TRANSLATION.
A 177	Schlenka, Polosstaja	Green Streaked.
" 178	Barlowskoe	Barloff's apple.
" 180	Nejolowskoe	Negoloff's apple.
" 181	Pipka Champanskaja	Champagne Pipka.
" 182	Kalville Kwasnuiletny	Calville Summer-red.
" 183	Burlowka	Burloffka apple.
" 184	Arabskoe	Arabian apple.
" 185	Anisowka	Anisette.
" 186	Steklianka Revels Kaja	Glass Revel apple.
" 187	Steklianka Selonka	Glass Green apple.
" 188	Arkad Scholti	Yellow Arcadian apple.
" 190	Tiesenhausenskoe	Tiesenhausen.
" 196	Polosatoe Sladkoe	Streaked Sweet.
" 197	Kriwospizoe	Curly Spiced apple.
" 198	Polu Miron	Crossed Barbel.
" 199	Naleiv Woskowoi	Waxen Juicy.
" 200	Repka Rosowaja	Rosy Little Turnip apple.
" 202	Saitschia Pipka	Hare Pipka.
" 203	Arkad	Arcade.
" 204	Rubez	Cut apple.
" 205	Kajabowka	Karaboff apple.
" 206	Zarski Schip	Czar's Thorn.
" 207	Stupka	Stoupka.
" 208	Korolewskoe	Royal.
" 210	Rubezuinogradni	Cut Wine apple.
" 212	Berkowskoe	Berkoff's apple.
" 213	Stepanouka	Stepanoff's apple.
" 214	Sadowskoe	Garden apple.
" 215	Kustoe	Bushy apple.
" 217	Sacharnoe	Sugar Sweet.
" 218	Fokinskoe	Fokin's apple.
" 219	Belaja Tebedka	White Swan.
" 220	Scholkowka	Silken apple.
" 225	Getmanski Bob	Getman's Bean.
" 226	Rubez Belui	White Cut.
" 228	Krimskoe Wochina	Vochin's Crimean apple.
" 230	Titouka	Titus apple.
" 231	Solotoi Arkad	Yellow Arcadian.
" 234	Muscatelnoe	Muscatel.
" 236	Antonouka	Anthony's apple.
" 240	Teschanka	Lieby apple.
" 242	Schriokolitschiko	Broadleaved.
" 245	Borouinka	Mushroom.
" 246	Plodowitka	Prolific.
" 247	Popouka Polosataja	Popoff's Streaked.
" 248	Beel	White.
" 252	Aport	O'Porto apple.
" 260	Simnoe Polosatoe	Winter Streaked.
" 261	Aport Reptschati	O'Porto Turnip Seedling.
" 262	Charlamoswkaoe	Charlamoff.
" 264	Duchowoe	Smelling apple.
" 265	Pipka Govkaja	Butter Pipka.
" 266	Polosatoe Nowgorodskoe	Novgorod Streaked.
" 267	Gruscheff ka	Pear apple.
" 268	Sakaritnoe	Saccharine.
" 269	Aport Rosowui	O'Porto Rosy.
" 272	Schapotschka	Little Hat apple.

NO.	RUSSIAN NAMES.	TRANSLATION.
A 273	Gruscheffka Bsennaja	Autumn Pear apple.
" 274	Rosowoe	Rosy.
" 275	Sototoreffka	Zolotoreff's apple.
" 276	Polu Stekianka	Half Glassy.
" 277	Wargul	Wargul.
" 278	Borowinka Krasnaja	Red Mushroom.
" 279	Aportowoge Simowoe	Winter O'Porto.
" 282	Renetto Woroneschski	Woronech's (name of a province.)
" 283	Slast	Apple Sweet.
" 284	Steklianka Kremer's	Kremer's Glassy.
" 285	Repristoe Walisonoe	Turnipy Juicy apple.
" 286	Kremerskoe	Kremer's, (seedling.)
" 287	Rigaer Skwosnoinalin	Riga Transparent Juicy.
" 288	Malinowskoe	Raspberry.
" 290	Ukrainskoe	Ukraine apple.
" 295	Imperial	Imperial.
" 304	Suislepper	Switzer.
" 310	Christapfel	Christmas apple.
" 313	Muscatapfel	Muscat, or Persian apple.
" 315	Herrenapfel	Lord's apple.
" 316	Rothe Reinette	Red Queen.
" 317	Golubinoe Beeloe	White Pigeon.
" 321	Pipka Sladkaja	Sweet Pipka.
" 322	Kovitschneoe	Browny apple.
" 323	Repouka	Turnip apple.
" 324	Neemezki Kallville	German Calville.
" 327	Scholti Arkad	Yellow Arcadian apple.
" 330	Polosatoe Naliwnoe	Juicy Streaked.
" 332	Plodowitka Ramaja	Early prolific.
" 333	Skwosnoi Krasnoi	Red Transparent.
" 334	Skwosnoi Schotoi	Yellow Transparent.
" 335	Skwosnoi Selennoe	Green Transparent.
" 336	Skwosnoi Beeloe	White Transparent.
" 337	Scrinka	Grayest.
" 338	Gruscheffka Revelskaja	Revel Pear apple.
" 339	Reinetti Beelui	White Queen.
" 340	Himbeerapfel Lievlander	Lowland Raspberry.
" 341	Borsdorfer	Borsdorf.
" 342	Scharlottenthaler Golba	Charlottenthaler (the name of a place) apple.
" 343	Weinapfel, Rother	Red Wine apple.
" 344	Sultanapfel	Sultan apple.
" 350	Lapouch	Burr apple.
" 351	Plodowitka Cuadkaja	Prolific Sweeting.
" 352	Swonkoe	Resonant apple.
" 354	Kriwospizoe Aromatnoe	Curly Spiced Aromatic.
" 355	Aport Herbst	Autumn Orange.
" 359	Motschetschnoe	Wetting apple. Literally, *apple to be preserved in water*, (as done in Russia.)
" 360	Funtowoe	Pound apple.
" 362	Swinzoffka	Lead apple.
" 364	Beel Wochins	White Wochins (a name) apple.
" 367	Polosatoe	Red Streak.
" 368	Mirone Sacharni	Sugar Barbel.
" 369	Pipka	Pipka.

NO.	RUSSIAN NAMES.	TRANSLATION.
A 370	Lebedka	Swan apple.
" 371	Skrut, Deutscher	Skrout, German.
" 372	Petrowskoe	St. Peter's.
" 374	Wislowchoe	Pendent Ear apple.
" 375	Koritschewoe Ananasnoe	Browny Pine Apple
" 377	Limonnoe Scholtoe	Yellow Lemon.
" 378	Orsimui	Hibernal apple.
" 380	Gruscheffka Moskoloskaja	Moscow Pear Apple.
" 382	Buzkafa Selonka	Russian Green apple.
" 385	Bodewskoe	Bode's apple.
" 387	Dobrui Krestianin	Good Husbandman apple.
" 393	Zitsonnoe Zarskoe	Imperial Citron.
" 398	Krupneena	Enormous.
" 399	Krimskaja Selonka	Green Crimean.
" 402	Borsdorfer	Borsdorf.
" 403	Anis Sacharnui	Sweet Anisette.
" 406	Pipka Sacharnaja	Saccharine Pipka.
" 407	Tschernoe Drewo.	Blackwood.
" 408	General Greig	General Greig.
" 409	S. Wochinskoe	Wochin's apple.
" 410	Repka Malenka	Little Seedling.
" 413	Skrischapfel	Cross apple.
" 424	Bergamottnoe	Bergamotte.
" 425	Anis Rospisni	Pointed Anisette.
" 426	Swinez	Apple "Lead."
" 427	Anisimowskoe	Anissim's apple.
" 429	Bosklonowka	Bosklonoff's apple.
" 430	Arkad Kruglui Woskowoi	Round Waxen Arcade.
" 433	Orlowskoe	Orloff.
" 437	Sachoiswan	Saxonian.
" 438	Rospisnoe	Pointed.
" 439	Krimskaja Beel	White Krim.
" 441	Grimuschka	Rattling apple.
" 442	Kalville Scholti	Yellow Calville.
" 444	Reinette Liubski	Lubsk (name of a place) Queen.
" 445	Romianka	Red-cheeked apple.
" 447	Ranette Kiluski	Queen of Kiew.
" 448	Kardinal	Cardinal.
" 450	Beel Krasawiza	Handsome White.
" 451	Warschtapel	Warsztappel.
" 453	Arkad Krasiwui	Beautiful Arcade.
" 455	Riabinouka	Berry apple.
" 457	Klinewskoe	Klineff's apple.
" 458	Scholtinaliw	Yellow Juice.
" 461	Rebristoe	Strong-ribbed.
" 462	Rubez Sclonniu	Green Cut.
" 463	Pipka Postillnaja	Spreading Pipka.
" 466	Repka Kislaja	Sour Turnip.
" 467	Miron Ploskui	Flattened Barbel.
" 468	Beel Rospisnaja	Pointed White.
" 469	Babuschkino	Grandmother's apple.
" 470	Lapouchoe	Burr apple.
" 471	Anisowaja Plodowitka	Prolific Anisette.
" 472	Ostrekowskaja Steklianka	Ostrekoff's Glass.
" 475	Postichouka	Holdfast.
" 476	Arkad, Rother	Red Arcade.
" 477	Roschdestwenskoe	Christ Birth apple.

NO.	RUSSIAN NAMES.	TRANSLATION.
A 478	Tonkowetka Polosataja	Thin Twig Streaked.
" 481	Mzenskoe	Mzedsk apple.
" 490	Glinzowoe	Clay apple.
" 502	Russische Rambour Reinette	Russian Rambour Queen.
" 544	Lapouchoe Naliw	Juicy Burr apple.
" 548	Borowinka Lugouaja	Meadows Mushroom.
" 551	Arbusowskoe	Water-melon apple.
" 555	Krass Sladkaja	Red Sweeting.
" 557	Revelskaja Polosatoe	Streaked Revel.
" 558	Konitschenewoe Rannoe	Early Cinnamon.
" 563	Krimskoo Naliwnoe	Juicy Krimtarter.
" 565	Wergunoks	Worgunok.
" 566	Krupnui Skworminaliw	Large Sub-acid.
" 568	Melonenapfel	Melon apple.
" 569	Rosenhager	Slender Rose.
" 575	Alabaster, Weisser	Alabaster White.
" 578	Boresdorfer Leipziger	Leipzig Borsdorf.
" 579	——— Tierlandischer Sommer	Summer Lowland.
" 580	——— Tierlandischer Winter	Winter Lowland.
" 584	Erdbeerapfel	Red Calvill.
" 585	Zusows Winterapfel	Zusoff's Winter apple.
" 587	Englischer Pepping	English Pippin.
" 592	Arkad Dilmui	Long Arcade.
" 595	Mzenskoe Sladkoe	Mzensk Sweet.
" 597	Pesolschnaja Steklianka	Glassy Sand apple.
" 599	Romenskoe	Omensk, (name of a place.)
" 600	Dlimoe	Long Apple.
" 864	Arkad Duimtschataja	Smoky Arcade.
" 874	Borowinka Sladkaja	Sweet Mushroom.
" 962	Reinette Muscateller	Queen Muscatel.
" 963	Muscateller Tievlander	Lowland Muscatel.
" 964	Herbst Streifling	Autumn Streaked.
" 965	Gruscheffka Sladkaja	Sweet Pear apple.
" 966	Tuchernokrasnoe	Bed-black.
" 967	Sclonnoe	Greening.
" 968	Saburonskoe	Aloe apple.
" 969	Zantarnoe	Zantar apple.
" 970	Tuhuginka Selomaja	Green Citron.
" 971	Wassilli Welikui	Vasilis Largest.
" 972	Trechtrshromnoc	Overflowing.
" 973	Stekliannoe Duschisstoe	Shining Aromatic.
" 974	Rasumowski Noschok	Razumoffsky's Downy.
" 975	Tenekrasnoe	Red Teat.
" 976	Tipka	Linden apple.
" 977	Tuhutilotschnoe	Aromatic.
" 978	Beel Solotofskaja	Golden White.
" 979	Beel Krupnaja Prodolgonataja	Large Long White.
" 980	Beel Plikano Uskaja	Plikanoff Small.
" 981	Beelowoe Scholto Seroe	White Russett.
" 982	Skrut Beelowoi	Round White.
" 983	Astrachanskoe Skwasnoe	Red Astrachan.
" 984	Anis Kurski	Koursk's (a name of a place) Anisette.
" 985	Anis Krasnui	Red Anisette.
" 986	Anis Selanui	Green Anisette.
" 987	Anis Schaltui.	Yellow Anisette.
" 988	Ananasnoe	Pine apple.

[From an unfinished article kindly sent in advance by the author, from the Report of the Montreal Horticultural Society.]

REPORT ON THE RUSSIAN APPLES

IMPORTED BY THE U. S. DEPARTMENT OF AGRICULTURE IN 1870.

BY CHARLES GIBB, ABBOTTSFORD, QUEBEC.

It is important to know which are the really good apples in this collection of 252 varieties. This collection of apples was received by the Department from Dr. Edward Regel, the director of the Imperial Botanic Gardens at St. Petersburg. A small proportion only of them had been grown in that fickle climate. They were. therefore, very largely "obtained" by Dr. Regel from different sources, and these mostly, though not wholly, from the coast Provinces of Russia.

There have been many drawbacks to the introduction of the Russian apple. Nomenclature in Russia is much confused, that of the Department list no less so. We have duplicates under different names, confusion of names as to types and families, evident mistakes. In Dr. Regel's work on Russian Pomology the lists of synonyms show how confused is nomenclature in Russia. Aport, which is of Kaiser Alexander family, is noted as a synonym of Antonovka, Titovka of Aport, Red Calville of Titovka, Titovka of Stklianka, Anisovka of Borovinka. If Spitzenburg and Northern Spy were synonyms of Golden Russet, the case would be somewhat parallel.

Unfortunately in the Department list, the name is, too often, no guarantee to the nature of the fruit.

Of the two apples named Red Astrachan, No. 1 is said to be Duchess, or something very like it, the other, No. 983 is a mistranslation, and not intended for it. Apples whose names state them to be of Greening, Anis or Blue Pearmain type, prove to be Duchess; Aports do not prove to be of Alexander family; Stekliankas the very opposite of Greenings. Apples marked Beel or Belui are far from white, and others noted as red, show no trace of it. Those marked winter, if from the northern part of the coast provinces, where the summer is short and cool, are by no means winter apples in our longer and warmer summers.

The early ripening of these apples on the Department grounds at Washington gave many the idea that they were all summer apples, that is summer irrespective of the climate they are grown in. Prof. Budd, of Ames, Iowa, in 1876 on August 20th, noted Borsdorf, No. 341, on the Department grounds, as "falling from the tree and about ready for use," while he quotes an authority from Northern Vermont saying, "a long keeping apple of finest quality." Again, Red Queen, No. 316, Mr. Budd notes as "a rusty green apple about mature the 20th of August, and falling from the tree." Mr. A. G. Tuttle, Baraboo, Wis., says: "Fruit of good size, red on the sunny side, season January to April." It may thus be seen that the Department test was no test at all as regards the quality and keeping of these fruits, nor were they so intended by the Department, their grounds having been used merely for the purpose of growing for distribution. These trees, as received by the Department, were labelled by number; they were also sent out by number. Some mistakes are observable, and mistakes will happen when things are received and sent out by number. These numbers referred to a list in Russian which was translated at the Russian Embassy in Washington and distributed by the Department. Unfortunately the Russian names are rendered into English sounds from a Russian not an English standpoint. These names should be rendered *euphonically* from an English point of view. Thns "ow" and "ou" are intended to be pronounced "ov" or "off," "ja" should be pronounced "ya." This has taken from the Russian all of its music. We should have uniformity in the spelling of the Russian names. We find naliw, naliv, nalin, naleiv, nallwnoe and even walisonoe, for the word translated juicy or transparent. We find scholti, scholtor, schaltui, soltoi, scholtoe for the word yellow. The word green is spelt in six different ways, but this is in part the work of the printer. We have Rannet Kiluski, Queen of Kiew, or Kiev, as we would say, but who would suppose Kiluski had anything to do with Kiev; any number of such mistakes.

The translation also is badly done.

The translation of the foreign names is unfortunate; sometimes merely unmusical, sometimes wrong. In 399 Krimskaja is rightly translated Crimean. In 439, Krim, and in 563, Krimtarter. In 200 and in 466 Repka is translated turnip, whereas in 410, it is translated seedling, which must be much nearer the truth, for apples of fine quality in Russia are known as Repka. The translation of the German names is still more open to criticism. In 355, Aport is translated orange, which it does not mean. No. 534, Erdbeerapfel (or strawberry) is translated Red Calville. No. 162, Buschbon is translated Buschbon. It probably is intended for Buschbohn dwarf bean. Sinisleper is translated into the English (?) word Switzer. The translation was done at the Russian embassy at Washington, but unfortunately the Russian who dictated it was not an apple grower, and did not know that he was disintegrating the foundation stones of Russian nomenclature in this country.

There is another drawback. In the North scions have been usually top-grafted on crabs. Growers in Vermont, Wisconsin and Minnesota are now agreed that the crab stock is uncongenial to the Russian apple. The experience of Mr. Tuttle will illustrate this. Of 127 Tetofsky, top-grafted on Transcendant, after ten years growth, but one living; on yellow crab, 2 trees alive out of 74, the Tetofsky having made a growth, before dying, of six to eight feet; of 57 on apple, all alive and doing well. Mr. Sias, of Rochester, Minnesota, and Mr. Webster, of South Northfield, Vt., often speak of fruit, medium in size, top-worked on crab, larger on apple. It is to be regretted that our first impressions of the Russian apple were either from specimens grown in the climate of Washington, or else from top-grafts on crab at the north.

My information in the following list is based vpon visits in August last to the orchards of Mr. Spaulding (formerly that of Mr. Moulton), near Minneapolis; A. W. Sias, Vice President Minnesota Horticultural Society, Rochester, Minn.; Underwood & Emery, Lake City, Minn.; A. G. Tuttle, Baraboo, Wisconsin;

State Agricultural College, Ames, Iowa; Elwanger & Barry, Rochester, N. Y. Also Mr. A. Webster, of South Northfield, Vt. and Dr. Hoskins of Newport, Vt., brought to the Montreal Horticultural Society Exhibition, samples of their Russian fruits, and gave me every opportunity of getting information from them. Oliver Gibbs, Jr., of Lake City, Minn., also furnished me descriptions of a few varieties found by him after my visit to that State.

Also in notes and drawings from Mr. Wm. Saunders, of the Department of Agriculture, but as the Washington climate is not the climate these fruits were intended for, I shall seldom quote from them.

Dr. Regel published his Ruskaya Pomologaya in 1868*. The trees received from him by the Department, arrived, I believe, in the winter of 1870. At that time Dr. Regel was making a vigorous effort to test, in the climate of St. Petersburg, all the varieties of fruit likely to prove hardy there. The fruits of the Province of St. Petersburg are carefully described. He also collected samples from Riga (from Messrs Wagner, Evegginger and Detrich) Novgorod, Dorpat, Pskov, Valaam, also from Iver, Moscow, Tchernigov, Tula, Veronesh, Penza, Kazan, Astrachan and other places. These samples he describes, sometimes noting local opinions as to their value, and sometimes merely noting the characteristics of the fruit as examined by him

This book is full of facts of interest to us. Dr. Regel assumes nothing. His work is grand, good, foundational work; but it was not followed up as it should have been, by a national convention of fruit growers, and by a national exhibition of fruits. The fickle climate of St. Petersburg, proving a severe test for many of the varieties he had gathered for trial in his nurseries, he ceased to experiment so largely; selected a smaller list of those best suited to the needs of his own climate; and henceforth Dr. Regel gave but little thought to apples, but devoted his vigorous energies to gathering from Central Asia those numberless Botanic rarities which have rendered the Imperial Gardens of St. Petersburg of such interest to men of the North.

1. Astrachaner Rother;—Red Astrachan;—If not Duchess, so like it as to be hardly distinguishable from it;—Spaulding.

60. Anasapfel Rother;—Red Duck;—Of the Yellow Transparent family. A large, oblong, conic, greenish yellow apple much like Yellow Transparent, skin rougher than Yellow Transparent and not as yellow, says Mr. Tuttle. Mr. Webster finds it a little better in quality than Charlottenthaler, but smaller in size and therefore not equal for market. At Mr. Underwood's it agreed exactly with Mr. Tuttle's description.

68. Champagner Fruher;—Early Champagne;—A small early conic apple, colored like a Duchess; a sharp acid with slight flavor. I saw this both at Mr. Tuttle's and Mr. Spaulding's, but am not sure if the same fruit or not.

Mr. Sias says, this is the earliest apple we know, an early and abundant bearer, rather tart, but an excellent pie apple. It is striped with red, beautiful in shape, and very hardy; Mr. Sias has had it bear the same season he grafted it on the Palmer Sweet Crab. It makes a good union on that stock. Mr. Saunders speaks of it on the Department grounds as a promising early fruit, small in size, but very pretty, and would make a fine cooking apple. Ripe enough to test on 24th of June.

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*Paragraphs in finer type are quotations from or the descriptions as given in Dr. Regel's book.—SECRETARY.

69. Summer Birnapfel;—Summer Pear;—A white apple, rather small, very conic, with wrinkled basin.—Sias. It seems not the same as Pear apple No. 267.

153. Skvoasnoi Nalin; Transparent Juicy—Dr. Regel describes this as one of the most popular kind of apples. It is grown in the North part of the Province of St. Petersburg, and in Provinces to the the South of Moscow. This and the White Na'iv constitute the larger part of the apples to be seen in the Province of St. Petersburg. This true Russian apple, on account of its good quality, heavy bearing, transparency and beauty, has become widely popular.

Transparent (nalivnoe) app'es are beautiful dessert fruits. They sell at high prices, ripen in September, and must be used at once. When the fruit is opaque it may be kept till December.

157. Belui Nalin; Juicy White—A white fruit of good size; acid, but milder when fully ripe, says Mr. Tuttle.

Dr. Regel say's the Belui Naliv is one of the most valuable of Russian apples, because it grows even in the Northern part of the province of St. Petersburg and at the Va'aam Monastery near the Northern end of Lake Ladoga, and in some parts of Finland. It takes first place before all others, just as does Skvosnoi Naliv, which is about as popular. It stands our severest winters at St. Petersburg, and bears every year or at any rate every second year, heavily. It grows without any care, grows in neglected gardens, and is the earliest green apple in our markets.

Ordinary samples are a little below medium in size; good specimens a good deal above it, and quite yellow when ripe. Season, August till December, but if not preserved very carefully it will rot in September and October. Dr. Regel notes as synonyms of this apple, the White Astrachan, of Lucas and Oberdick and the Possart's Moskauer Na'ivia of Lucas and Oberdick. This apple, however, is not at all of white Astrachan type.

The Belui Skvosnoi Na'iv, Dr. Regel describes from samples received from Nishny Novgorod, and the provinces of Moscow and Vladimir, and the South. He says he thinks it is often mixed with Naliv Belui.

161. Langerfeldskoe.—Longfield.—An early winter fruit of fine quality, and bright attractive color. As pointed out by Mr. Webster, it is the same as No. 587, English Pippin. Mr. Budd was told at the nursery of Mr. C. H. Wagner, at Riga, that this apple was a seedling grown by an Englishman on the Volga, and that it was sometimes known as the English Pippin, and sometimes Longfield, supposed to be from the shape of the field the tree was growing in. Mr. Budd received it both from Moscow and St. Petersburg, and he has that of the Department list I believe under both numbers. His are all alike and true to name. It therefore seems to be one of those apples which is apt to come true to name from different sources. Mr. Tuttle, says it is as good a bearer as Duchess, and thinks the finding of this worth all the trouble and expense he has had of testing so many Russian varieties. The flesh is white and fine grained; the skin bright yellow and bright pink. Mr. Tuttle says it would be safe to plant 1,000 trees of it. Its fault is its small size; a fault increased by top-grafting on crab, but those who are growing it on apple roots in rich prairie soils in the West, do not seem to grumble at its smallness in size.

Dr. Regel says the Langerfeldskoe as far as we know has been grown only in the garden of Mr. Longfelder, at the German colony of Sarepta, on the Volga, half way between Saratov and Astrachan. It is a lemon colored apple, red on the sunny side with white tender, juicy flesh. Neither the cold nor the winds nor the storms of the intensely steppe country of Sarepta disturb the growth of this tree. Of 100 different varieties growing in the garden of Mr. Longfelder, only this one bears fruit every year. Let us remember that Sarepta is not a high northern climate.

162. Buschbon;—Buschbon;—Mr. Saunders, of the Department of Agriculture, at Washington, says, a very good summer fruit, somewhat aromatic in flavor, ripe about June 22nd.

164. Polosatoe Heidorns;—Heidorn's Streaked;—A very beautiful, large sized, striped apple, sweet and of delicate texture, but short in season. Such were the specimens brought to the Montreal Horticultural Society Exhibition. Mr. Webster finds the fruit large and fine even when grafted on crab. The tree, Mr. Webster says, is of slow growth and a moderate bearer.

166. Aport Letny;—Summer O'Porto;—A large, flattened, angular, brown cheeked apple, of fair quality.—September. It is not of Aport or Alexander likeness, says Mr. Webster.

Dr. Regel speaks of this as a fruit samples of which he received from the province of Moscow, and Tchernigov, and seems to have been named by Mr. Atriganiev. It is at first a greenish yellow, and becomes, later, a beautiful yellow, like wax with dots. The flesh is tender, juicy, agreeable and mildly acid. A nice early table apple from September to December. It is different from the Skvosnoi Nalio, being larger in size and more yellow in color. It endures well their cold winters. The colored picture in Dr. Regel's book is a somewhat ribbed apple, a good deal like Charlottenthaler.

167. Scholtoe Sladkoe;—Yellow Sweet;—Mr. Tuttle says fruit medium to large, earlier than Yellow Transparent.

178. Barlowskoe;—Barloff;—An apple of distinct family features, as I saw it in Mr. Tuttle's orchard showing near relationship in its size, form and color. It is a sweet apple of fair quality, ripe at the beginning of September. Perhaps it may be the Sweet Aport that I saw in Orel in Russia. That grown by Mr. Webster however is a flat sub-acid thin-flavored fruit and in shape more like Zolotoreff and Turnipy Juicy and of no special merit.

180. Nejolowskae; Negaloff;—An October fruit of good size and fair quality, but not of special value. Tree of Duchess growth, says Mr. Webster.

182. Kalville Kwasnoilety;—Red Summer Calville;—Dr. Regel states that there are many of these Calvilles, German, Polish and Russian, but this is the variety which has been grown in the province of St. Petersburg, and specimens of it appear in the collection sent from Moscow and the south provinces. It is an apple about medium size, pretty well covered with red. The flesh is white, near the skin a little red, very tender, a highly agreeable vinous acid. It ripens the end of August and beginning of September and keeps till November or December. On dry soil the tree suffers in severe winters, and yet it is stated to be one of the best, if not the best, summer apple for the St. Petersburg climate.

The Krasnoi Simnoi Calville which I saw in the grounds of Ellwanger and Barry last summer was, as far as I can remember, very like the colored plate and description of Dr. Regel. Although in name Winter (Simnoi) it ripened in August.

Dr. Hoskins has also the Red Summer Calville which he received from James A. Nelson, Indian River, Mercer county, Pa., who speaks of it as a fine, early dessert apple and the only Russian he has found to be of any value.

184. Arabskoe;—Arabian;—There is some mistake here. Both Mr. Budd and Mr. Tuttle have fruited this apple, and it appears to be a Duchess or an apple very closely resembling it. The Arabskoe of Ellwanger and Barry is a large flattish fruit, of deep pink color, very beautiful, though only of fair quality and not a long keeper like the Arabskoe we saw at Volsk. This was received from Moscow, and yet hardly agrees with the description given to me by Mr. Shroeder, at Moscow, as a flat, conic hard, winter apple. However No. 316, Lord's apple, is a true Arabskoe.

Dr. Regel speaks of the Arabskoe as being grown at St. Petersburg and in the provinces to the south of Moscow. When on the tree the apple is green; afterwards a yellow green, and on the sunny side a peculiar shade of dark, dingy red, covering one third or half of the apple. The flesh is white, hard and sour, and when ripe, somewhat

tender and agreeably sour. The tree is hardy at St. Petersburg, only young trees being injured there. The tree is large and bears a medium amount of fruit, which ripens in October and keeps till spring or next fall. It is recommended as one of the best winter apples.

Dr. Regel also received samples from Astrachan and from another place. The wood cut given by Dr. Regel is from a specimen of St. Petersburg growth, and from its conic almost Gilliflower form, is quite unrecognizable as an Arabskoe. Dr. Regel's colored plate is from a specimen from Astrachan, and is more like those we saw in Russia. Dr. Regel believes these to be the same, only modified by climate.

The Arabskoe Polosatoe, known to Dr. Regel only from sample from Riazan, southeast of Moscow, is described as a yellowish, green, kitchen apple, with a dark carmine red side; a tasteful vinous acid. In season from November till the end of winter.

185. Anisowka;—Anisette;—Mr. Tuttle says this is Duchess.

The Anisovka seems to be the best variety of the Anis with which Dr. Regel is acquainted. It is grown in the provinces of St. Petersburg and Moscow, and southward from these points. It has even been grown at the convent of Valaam. Dr. Regel says, that the trees have stood the worst winters at St. Petersburg, and bear heavily every second year. It is very popular, and fetches high prices, as it is good, either for eating or cooking. It reaches its perfection at the end of September and may be kept till February or even March.

187. Steklianka Selonka; Glass Green;—Just like Duchess, say Mr. Spaulding and Mr. Tuttle, in tree and in fruit, but stated by both to be later in ripening. Mr. Tuttle also says, that the tree is a stronger grower. There is some mistake here as the Stekliankas or Greenings are of a different type.

188. Arkad Scholti; Yellow Arcadian;—No's. 231 and 327 in the catalogue bear the same name. The Arkads in Russia are early sweetish apples, of medium size, valued only for their earliness and the hardiness of the tree. Mr. Sias has fruited No. 188 and speaks of it as one of the most successful varieties on the Hislop Crab, as far as the tree is concerned. Fruit nearly white and glossy, roundish, of full medium size, second rate in quality, a shy bearer. Some others who have fruited Yellow Acadian do not know under which number they obtained it. Mr. Saunders sends me a cut taken in the grounds, at Washington, of 231, which is over three and a half inches wide and three inches deep. Mr. Saunders says, it is an apple of good size, deep yellow, striped with red, flavor not high, but a good cooking fruit. We must not assume these yellow Arcadians to be all alike,—in fact we must assume nothing.

190. Tiesenhausenskoe; Tiesenhausen;—Mr. Tuttle says that this is in form and color like Ben Davis, of good quality, and the best keeper of all the Russians fruited with him. Tree a fine grower and very hardy.

Dr. Regel speaks of this as a fruit introduced by Baron Tiesenhausen into the province of St. Petersburg, whither it was sent for exhibition in 1860 and in 1866. Baron Tiesenhausen seems to have received it from Dorpat, but Dr. Regel queries whether it is known in the coast provinces, and names it after the gentleman who brought it into notice. It is a yellow apple with scarcely a tinge of red as grown in the north. Some specimens are oblong, conic; others, singularly, abruptly conic towards the cavity, as well as towards the basin. The flesh is white, tender, juicy, sub-acid, good for table and home use; ripe in September and keeps, says Baron Tiesenhausen, till March. The tree is small, but productive, and suffers only in the severest winters at St. Petersburg

197. Kriwospizoe.—Curly Spiced.—An apple, somewhat of Alexander features. Mr. Tutle says it has been condemned in the east, but it is an apple of pretty good quality, with some flavor; not bad, but we have too many of such apples.

198. Polu Miron;—Crossed Barbel;—Dr. Regel says this is grown about St. Petersburg and in the provinces to the south of Moscow. It is an apple from small to medium size: a yellowish green in color, with red on one side, in splashes and stripes. Farther

south it is more highly colored. The flesh is tender and sweet, with a kind of bitter after taste, which it loses when fully ripe. The tree is upright, bears plentifully and does not suffer during cold winters at St. Petersburg. It ripens in the beginning of September, and keeps some months later. Recommended for home use only.

202. Saltschia Pipka;—Hare Pipka;—Dr. Regel says this is grown about St. Petersburg, and it seems in the coast provinces also; an oblong, conic apple, of medium size, green or greenish yellow, with some red in splashes. Flesh is white, tender and juicy, and has an agreeable, vinous flavor. The tree grows to a large size and stands the climate of St. Petersburg well. A table apple that keeps till winter. According to Baron Tiesenhausen, not productive.

206. Zarski Schip.—Czar's Thorn.—Mr. Webster says, an extremely hardy tree, the scions and spurs having a peculiar, stiff, thorny appearance. Fruit, large, coarse, watery, bitter and worthless. I think there is some mistake here. Mr Tuttle describes it as a sweet apple. That of Ellwanger & Barry, and which was received from Moscow, they describe as a large oblong, sweet, apple, skin red and yellow. If sweet, and nearly all yellow, it is very like that which we saw on the upper Volga.

Dr. Regel speaks of this as a pale, yellow apple with light dots. Flesh, greenish white, tender, juicy and sweet. According to Krasnoglasov, and other apple dealers in Moscow, it often becomes transparent. Young trees suffer in severe winters at St. Petersburg. Dr. Regel thinks it is grown all through the south provinces, but in small quantities only. Dr. Regel describes two other apples under name of Czar's Thorn.

210. Rubezuinogradni.—Cut Wine.—Size and shape of Maidens Blush, a sharp, acid apple, with some flavor, October.—Webster.

This, says Dr. Regel, is grown in the province of St. Petersburg It would seem from the cut in Dr. Regel's book, to be an apple about medium size. When upon the tree it is green; when ripe, yellowish green—sometimes with a nice, red cheek. The flesh is greenish white, tender and agreeable sub-acid. A good autumn table and cooking apple, said by some people to keep till February, but the samples Dr. Regel had rotted in October.

212. Berkowskoe.—Berkoff.—Fruit, much like German Calville, probably the same.—Tuttle. See 324.

214. Sadowskoe.—Garden.—A smooth green, crude, fall apple, sweetish or very mildly acid, fruit medium in size and quality. Tuttle.

219. Belaja Tebedka.—White Swan.—A large good-looking fruit, rather acid on June 28th, says Mr. Saunders.

220. Scholkowka.—Silken Apple.—A handsome fruit, nearly white, of fair size and good quality. Season September. Sias.

225. Getmanski Bob.—Getman's Bean—Tree, says Mr. Webster, a slow grower, of peculiar, irregular, spreading habit, and a tardy bearer. Fruit large to very large, striped, magnificent, firm, crisp, and of most excellent flavor. Season, October. Mr. Tuttle says, it is one of the best trees, and speaks of the fine size and appearance of the fruit, and its probable market value. The fruit as I saw it at Mr. Tuttle's, showed the size, angularity, flatness, and conciseness of an Anis, of the striped or mottled type, but the fruit as I saw it this year was below par.

228. Krimskoe Wochina; Vochin's Crimean.—Dr Regel describes this only from samples grown by Mr. Vochins from Pskov. It is a yellowish green, and when quite ripe, waxy yellow, with more or less red on the sunny side. Flesh pure white, very juicy, a very agreeable, vinous acid, with fine after taste. One of the best Russian table apples. It ripens the end of September and keeps till the end of February. Mr. Vochins had received it as the Crimean, and as there are other apples under that name, Dr. Regel has named it Vochin's Crimean. Its hardiness and productiveness are not stated.

230. Titouka.—Titus.—I do not know of this having been fruited. An apple known as Titovka is grown along the Volga, and throughout Middle Russia. We saw it every where and in quantity. Mr. Budd described it as the market-woman and car-boy apple, of those regions. In Western Russia, however, there is another apple that is known as Titovka. Ellwanger & Barry received their Titovka from Moscow, which they describe as a large handsome fruit resembling Twenty Ounce, and which they say is the largest and showiest of the New Russian, which they have tested thus far. A specimen sent by them to Ames, Iowa, was tested by Mr. Budd and myself. It is strikingly like Zolotoreff; a sample of which, I had brought from Mr. Tuttle's, but it seemed different in flesh. A sample lately sent by Mr. Goegginger, of Riga, Russia, to Mr. Willim Evans of Montreal, would seem to be this same apple, the same I believe as that described and pictured by Dr. Regel, in his Pomology.

Dr. Regel says that this apple originated at the little hamlet of Titov, between Tula and Kaluga, and received very favorable notices in the Journals of some of the Moscow Societies. He says that it is grown from St. Petersburg southwards. Dr. Regel speaks of it as green when on the tree, afterwards as becoming a yellow green or lemon color, with some red in the sun, and in the South, a blood red.

Dr. Ed. Jankowsky, Director of the Pomological Gardens, at Warsaw, in his "Sad i ogrod owocowy," says, that in Poland it is known, as the Toulski or apple from Tula. He described it as a large beautifully yellow, and nicely blushed or painted dark red, with larger or small stripes, tender, and very good. Mr. Budd thinks that the Titovka received from Veronesh is not the same in leaf as that of the Department.

236. Antonouka;—Anthony;—The Antonovka is the king apple of the Russian steppes, and I hope that this apple, in the Department list, is true to its name. Those received by Mr. Budd from Moscow, St. Petersburgh, Riga and Veronesh, and perhaps elsewhere, all seem true to name, but he has no scions of it from the Department. Mr. Tuttle showed me good, healthy trees, in an orchard adjoining his own. They were not in bearing, but the fruit borne last year answered my description exactly. The Antonovka, of Ellwanger and Barry, is true to name, but it was received from Moscow.

240. Teschanka;—Lieby;—Mr. Oliver Gibbs, Jr., of Lake City, Minnesota, speaks of this as growing in Carver county and closely resembling 378 Hibernal both in tree and in fruit. The tree is spreading and irregular in growth such as nursery men do not like; fruit large rather flat in shape, tapering toward calyx; color red and streaked. Of these Lieby is a little the riper; they are good sub-acid cooking apples.

Mr. Sias says that this is identical with 374, Pendant Ear. Hardy, free from blight, of Duchess type and a good annual bearer. It was exhibited at the winter meeting of the Minnesota Horticultural Society, at Minneapolis, by Andrew Peterson, Carver County, Minnesota, but past its season.

245. Borouinka.—Mushroom.—Mr. Budd says like Duchess, but a month later.

Dr, Regel speaks of the Borovinka as one of the most important of the Russian apples, and says it is grown largely as far as the provinces of the south of Moscow. It has been grown even at the convent of Valaam, an island in Lake Ladoga. The tree is large and spreading, and stands the coldest winters of the St. Petersburg climate, bearing fruit every year and bearing very heavily alternate years. This tree is named after the family of Borovinyh in the government of Tula. The fruit is large, lemon colored, with marblings, splashes and stripes of bright red. When uncolored, owing to wet weather, it is known as the White Borovinka. And different names are given to it according to its size and color. The flesh is white—sometimes tinged with red—tender, agreeably sour with a very nice aftertaste. Some specimens had decayed in September; others kept till the beginning of December. An opinion cited by Dr. Regel gives to the Borovinka a place second only to Antonovka. I have spoken in my report on Russian fruits, of Borovinka as the family of which the Duchess of Oldenberg is a member. In this catalogue the Duchess appears under all sorts of names, yet we did not see the Duchess in Russia; neither have I yet been able to find out the Russian name for it. In the pomology by Dr. Regel, of the 144 apples of which a colored print is given, the Duchess certainly does not appear.

In the "Sad i ogrod owocowy" by Prof. Jankowsky, of Warsaw, there is given a description of Charlamouskoe which is very much like Duchess, noting also that it is known to the French as Borvitsky. In the "Deutche Pomologie" by W. Lauche of the Pomological Gardens, at Berlin, there is a beautiful colored print of Charlomovskoe which one can scarcely believe to be other than Duchess. The description too, is Duchess, and among the synonyms are Brovitsky and Duchess of Oldenburgh. I think I have thrown enough light on this subject to render the darkness visible.

246. Plodowitka; — Prolific; — A good cooking apple but a little bitter.—Spaulding.

247. Popouka Polosatja; Popoff's Streaked;—A mild sub-acid and aromatic dessert apple, size medium or small, yet not of special value.—Webster.

252. Aport;—O'Porto;—Dr. Regel says this is one of the most popular of Russian apples grown at St. Petersburg and southward into the Baltic provinces. In color it is green and yellowish green, often with more than half of the apple covered with red. Flesh yellowish, white, juicy, and, after it is ripe, tender, vinous acid, with nice, agreeable after taste. Dr. Regel says Aport is one of the most generally liked of our table apples. It ripens in October and keips till May. With care it may even be kept till July. It sells at high prices on account of its high color and attractive appearance. From Dr. Regel's picture it is plainly of Alexander type.

Among the many synonyms given by Dr. Regel to this apple I find Titovka, and also Kaiser Alexander of the German pomologists. The Kaiser Alexander described by Mr. Jankowski and by Mr. Lauche are much more like our Alexander.

Dr. Regel speaks of the Alexandrovskoe as grown to the south of Moscow, and describes it from samples in the collection sent by Mr. Borovinsky. It seems to be an apple of Alexander form, but much smaller and with a singularly long stalk. A yellowish apple with a little red on one side, hard in texture, but afterwards becomes tender, and a vinous acid.

262. Charlamowskoe;—Charlamoff;—An early fall apple, large and oblong, streaked with red and of excellent quality, says Mr. Oliver Gibbs. Mr. Webster speaks of the fruit as large and handsome, resembling Duchess, but more conical in form and less acid, and of much better flavor. Strange enough, the above two descriptions are exactly that of the Titovka of middle Russia. Mr. Webster on reading my description of the Titovka we saw in Russia at once thought of Charlamoff. However, with Mr. Webster the Charlamoff soon turns watery and rots, and hence is valuable only for a quick and near market. Mr. Webster querries whether his slaty soil has anything to do with this, and has ceased to cultivate it. The Titovka we saw in Russia in all stages of ripeness, and it showed no weak point such as Mr. Webster describes. [Mr. Andrew Peterson values this very highly for an early apple.—*Secretary*.]

264. Duchowoe;—Smelling Apple;—Mr. Sias says A No. 1 fruit, strongly perfumed, almost equal to the sweetest rose. The color of Red Gilliflower and the size of black Gilliflower. Season last of August. It died because grafted upon an uncongenial stock.

Dr. Regel describes the Duchowoe from samples from the province of Tchernigov and also from Baron Tiesenhausen, a yellowish green or yellow apple, with a good deal of red on one side and rather above medium in size. Flesh white, juicy, agreeable and vinous acid. Dr. Regel says, a fine looking fruit, good for table and cooking, ripe in September and will keep till December. Dr. Regel says, most highly perfumed.

275. Sototoreffka;—Zolotoreff;—Mr. Tuttle thinks highly of this as a fall market apple. It is a large cylindrical showy apple with a good deal of color. Flesh a little coarse, but juicy and spicy, with a good mingling of sweet and acid, keeps till November. Mr. Webster speaks of it as a large showy apple, very productive and ripe in October, but flattish in form and oblong, and a specimen received from Mr. Webster, Mr. Tuttle said was not like his own. Mr. Downing has expressed a favorable opinion of Zolotoreff, but which I do not know.

277. Wargul;—Wargul;—Dr. Regel says that the Vargul is one of the most popular apples at Voronesh. When fully ripe it is a yellowish green, with red on the sunny side, covering half or three fourths of the fruit. The flesh is soft, white and juicy and somewhat acid, of most agreable brisk flavor with nice after taste. For its good looks and its flavor it is much liked both for the table and kitchen. Season from October till the end of winter.

279. Aportowoge Simowoe;—Winter Oporto.—This apple did not suggest to Mr. Sias any Alexander parentage. The fruit was below medium in size when grafted on Hislop crab; a trifle above medium, on apple root. It is more flattened and less red than Alexander. Mr. Sias has fruited it for three years and rather likes it; although it is not of fine quality. The tree seems hardy. Among these winter aports in Russia, we find some remarkably good apples; one which we tasted in the Kozlov market was just like Alexander in appearance, but tough in texture, a mingling of sharp acid and sweet, an apple of fine quality and evidently a good keeper.

Dr. Regel describes an Aport which keeps from October till May. Mr. Shroeder, at Petrovskoe Rasumovskoe, near Moscow, says Aport or Kaiser Alexander is aromatic in flavor and keeps till spring. Mr. Wagner at Riga notes his Aportapfel grosster, as a late winter apple. I mention this because Emperor Alexander, which is but another name for these apples, should be imported for trial from all possible sources in Russia.

Dr. Regel describes Winter Aport from samples received from the Garden of Mr. Atriganiev in Tchernivgov. In color a light green and on the sunny side a dull, dark, red covered with carmine in splashes and stripes, covering often three-fourths of the surface. Flesh, greenish white, rather crude, sour. A good kitchen apple which keeps all winter. The colored print as given in Dr. Regel's book is strikingly like that which we saw at Tenki on the Volga, at Prince Gagarine's—a large, handsome, oblong, winter apple.

285. Repristoe Walisnoe; Turnipy Juicy.—This is a large or very large, somewhat oblong apple, rather better in quality than Alexander and about as well colored. It carries well and keeps toward winter. A showy market fruit which Mr. Tuttle thinks a good deal of. It ripens with Alexander.

236. Kremerskoe; Kremer's;—This I saw in Mr. Sias' orchard; a rather large, tender apple of good quality. Mr. Sias seems to think a great deal of it. Season probably about September.

288. Malinowskoe; Raspberry;—Mr. Tuttle says fruit of medium size, bright red, very beautiful and mild, pleasant sub-acid when fully ripe. Flesh quite red. Dr. Regel speaks of the Malinowskoe as an apple of which he had merely seen a specimen from the garden of a farmer in the Province of Novgorod. I should describe it as a small apple with a large wide core. It is a yellowish green and on the sunny side a reddish yellow. Flesh

sweet and of use for cooking. Ripe in September and does not keep long. Tree not hardy.

Another Malinovskoe is described by Dr. Regel. A small sized, round, reddish applet grown about St. Petersburg and Moscow. Flesh white, often redish, under the skin, tender, juicy, agreeable, vinous acid, with a nice aftertaste. The tree stands the worst winters in St. Petersburgh. The fruit is nice looking and recommended for table use on account of its fine flavor. Season from September until the end of winter,

Mr. Saunders, of Washington, says:—A small apple very brilliant in color, crimson. Flesh white and very juicy, sweet and crisp. According to the cut given by Mr. Saunders, it cannot be the first given above. From the description given it does not seem to be the second. See No. 340, for the Malinovskoe Lievlandskoe, (Lievlander Himbeerapfel) is the Himbeerapfel or Malinovskoe of Mr. Goeggiger, of Riga; that is I mean the same in name.

290– Ukrainskoe;—Ukraine;—I saw this in bearing at Mr, Underwood's. The fruit was large and fine, though top-grafted on crab. I saw it in bearing at Vilna in the west of Russia; a large apple like an uncolored Northern Spy. It has the name in Russia of being a hardy tree, but a light bearer of apples of second quality that keep and ship well. I rather think this apple is true to name.

304. Suislepper; Switzer;—Mr. Webster says we have a hardy, vigorous tree, a good bearer of handsome apples, valuable for home use and for market. Fruit medium to large, often covered with red; juicy, half fine, tender, with a fine sub-acid, slightly quince in flavor, more like French than Russian apples. A good keeper for its season, which is September and October. Dr. Hoskins, however, says as it bears on the ends of the shoots it is apt to fall off. Other than that, he is inclined to think highly of it. It is certainly an apple of fine quality and Mr. Downing says "Undoubtedly valuable for home use or commerce."

315. Herrenapfel; Lord's apple;—Mr. Tnttle describes this as a large fruit, the size of Blue Pearmain, with much the same color and bloom; a clear, strong, pleasant acid; an apple that hangs well on the tree and keeps longer than Longfield. Mr. Tuttle also says the tree is hardy and a good grower, so that he considers it one of the most valuable he has tested. Mr. Sias says on Hyslop crab stock, only medium in size and not quite as good a keeper as Blue Pearmain. This is evidently an Arabskoe. The Riga catalogues contain both the names of Arabskoe and Herrenapfel, although Mr. Wagner does not mark either of them as late winter. Mr. H. Goegginger says that the Herrenapfel or more correctly the Polnischer Herrenapfel is of medium size. red all over, of the first quality, and a good market apple from October to December. He says further that it is a hardy and large tree which bears very well; and he thinks highly of it.

316. Rothe Reinette; Red Queen;—This Mr. Tuttle believes to be the same as his Rennet Red. Fruit of good size, dark green with red side; keeps till March.

317. Golubinoe; Beeloe; White Pigeon;—This is a small fruit. very conic in form, with wrinkled eye and no basin. A sweet apple, of fine but very peculiar flavor, and of defective texture. Both Mr. Sias and Mr. Webster speak of the extra hardiness of this tree. Those who have fruited this do not speak of its defective texture and I must have tested an unfair sample. Mr. Sias says "tender and juicy."

321. Pipka Sladkaja; Sweet Pipka. — An excellent, though undersized, striped, autumn sweet apple—that died from being grafted on an uncongenial stock.—Sias.

322. Kovitschneoe; Browny;—Like Duchess. but hardier and later in the season, and has less acid.—Tuttle.

324. Neemezki Kalville;—German Calville. Mr. Webster says, this tree is a fair grower, an early and abundant bearer. Fruit large to very large, flattened and ribbed. It is in best condition from December till January, but may be kept till March. Specimens brought by Mr. Webster to the Montreal Horticultural Society Exhibition, had much the appearance of the White Calville of France.

330. Polosatoe Naliwnoe; Juicy streaked;—Mr. Sias says: Fruit medium or above, good in quality, tree hardy. Season last of August or the beginning of September.

Dr. Regel says, that this grows about St. Petersburg and Pskov. Judging from the cuts in Dr. Regel's book it is a medium sized, conic, yellowish-green apple with a little red on one side. It seems not quite as hardy as some other Nalivs.

333. Skwosnoi Krasnoi; Red Transparent;—A sweetish apple of White Astrachan type, but more bright and attractive in color.—Sias.

334. Skwosnoi Schetoi; Yellow Transparent;—This is one of the best known of the apples in this catalogue and has been propagated a good deal in the place of the Tetofsky. Now Charlottenthaller looms up as a rival both in size and earliness.

335. Skwosnoi Selennoe; Green Transparent;—Much like Yellow Transparent, but smaller and more conical and the tree less vigorous in growth, says Mr. Webster. Mr. Tuttle says it is White Astrachan.

336. Skwosnoi Beeloe;—White Transparent;—Just like Yellow Transparent, says Mr. Tuttle, if any preference I should choose the White. Mr. Webster would leave it out in favor of the others. Dr. Hoskins says, considerably smaller than Yellow Transparent; whiter, rounder and better in quality—very like Early Harvest.

337. Scrinka;—Grayest;—I have not yet heard of this Scrinkia having been fruited. It is a popular autumn dessert apple in the Baltic provinces. Mr. Goegginger of Riga says of the two trees named Scrinka, that the red is the valuable one. This, as received from Mr. Goegginger, is not that which Mr. Budd had received from St. Petersburg. Mr. Budd says it is very distinct in tere. The fruit sent hy Mr. Goegginger to Montreal this autumn was mostly a dull red, in close marblings and stripes. I mention this to enable the fruit to be identified.

338. Gruscheffka Revelskaja;—Revel Pear;—This I saw in the orchards of Mr. Sias. It is mild in flavor, being neither sweet nor sub-acid; water cored. but very nice; very good quality for an apple of that kind.

340. Himbeerapfel Lievlander;—Lowland Raspberry;—A medium sized, ribbed apple, of pretty good quality, says Mr. Tuttle.

Dr. Regel says that he has only seen samples of this from the Baltic provinces. Judging by the cut it would appear to be an apple above medium in size and roundish conic. In color, says Dr. Regel, a dull, yellow green, and with dashes occasionally and spots of red. The flesh is white, fine and juicy; has scarcely any acidity, with a slight degree of aftertaste, suggesting the taste of the strawberry; an excellent autumn table apple, that keeps from September till the new year. This tree does not stand the coldest winters very well. Dr. Regel says this is the Himbeerapfel or Malinovskoe of Mr. Goegginger, of Riga.

342. Scharlottenthaller Golba;—Charlottenthaller;—This is, perhaps, the best of the family of which the Yellow, Green and White Transparents, and Red Duck are members. Mr. Webster also places Sweet Pear and Moscow Pear in the same group. In the opinion of Dr. Hoskins it is rather larger than the Yellow Transparent, and it is thought by some to be a little earlier. Mr. Webster says, its season commences and closes ten or twelve days earlier than Red Astrachan. Dr. Hoskins, however, declares that it is not a day earlier.

343. Weinapfel Rother;—Red Wine;—This is much like Sops of Wine in appearance, and very handsome. It is below medium in size, quite acid and earlier than the Duchess, says Mr. Tuttle. Mr. Webster says, sharp, acid fruit, like Red Astrachan; perhaps a seedling of it.

350. Lapouch;—Burr;—A small or medium sized flattish apple, yellowish, white. A tart pie apple A hardy tree and a good and early bearer, says Mr. Sias. No. 470 is the same name but whether like this or not, I cannot say.

351. Plodowitka Caudkaja;—Prolific Sweeting;—A yellow apple of medium size. The best of the sweet apples for market purposes, says Dr. Hoskins. Mr. Webster says the tree is of the Tetofsky type, and very productive. An excellent sweet apple, ripe in August and September.

355. Aport Herbst;—Autumn Orange;—Mr. Sias showed this in good condition at the winter exhibition of the Minnesota Horticultural Society from the 16th to the 19th of January last, and took second premium. Fruit small, irregular in shape, dull, greenish yellow, not valuable, at least not on Hislop Crab stock. The wrong translation of these names is much to be regretted.

364. Beel Wochins;—White Wochins; Tree slow grower, an early and good bearer, A smooth, handsome, sub-acid apple, ripe in September. Not equal to Duchess for general culture, says Mr. Webster.

368. Mirone Sacharni;—Sugar Barbel;—Mr. Webster says a good bearer, of medium sized, striped, sweet apples, for general purposes, not equal in value to Prolific Sweeting, otherwise of value. Dr. Hoskins says, a brilliant red, nice sweet apple, but too small for practical value, it will not average one-fourth the size of the Prolific Sweeting. Season, September.

Dr. Regel describes this as an apple of medium size, or below. A yellowish green or yellow with some dingy red in splashes; sometimes with a good deal of red on the sunny side. The flesh is tender, white, agreeable and very sweet, and with an agreeable aftertaste. The tree stands the coldest winters at St. Petersburg, and hence is a favorite early apple and brings a good price. It ripens in August and keeps till December. I may be said to be good for eating, though not strictly a dessert fruit.

372. Petrowskoe;—St. Peter's;—Dr. Hoskins has characterized this as the Russian "Early Joe." He considers it better than Switzer and the best of the Russian dessert apples of its season, which is during August and September. Mr. Webster says: a good bearer of small but handsome fruit, striped with red, fine in grain, of fine flavor for a Russian; better perhaps than Switzer, but does not carry as well. I also saw this fruiting at Mr. Underwood's.

374. Wislowchoe;—Pendent Ear;—Resembles Duchess in size and color and about as prolific, but too astringent. Sias says it is the same as 240.

378. Orsimui;—Hibernal;—Mr. Tuttle especially calls attention to this as worthy of trial in the colder climates. It is an early and good bearer, of large and showy apples, blushed with red, and with large light dots. A good cooking apple, said to keep well till December. Mr. Oliver Gibbs thinks highly of trees said to be it, which he has found bearing in Carver county.

380. Gruscheffka Moskoloskaja;—Moscow Pear;—I would like to hear of this as having fruited, as in Russia it seems to be the favorite early market apple. In Middle Russias though small and white, its extreme earliness gives it value.

382. Buzkafa Selonka;—Russian Green;—This I saw in the orchard of Mr. Sias, without doubt an Anis, of the type of the Blue Anis of the Volga. It is a medium-sized apple, flat conic and five sided. Flesh crude and as yet uneatable. The fruit I saw at Mr. Tuttle's was just like it. This variety should be tried in the far north.

393. Zitsonnoe Zarskoe;—Imperial Citron;—A good grower and great bearer. Fruit of good size and fair quality, but not of special valne. September. Webster.

398. Krupneena;—Enormous;—An apple of Alexander type and perhaps the largest of the August apples. It is light in color, shaded with red, striped with red, almost covered, oval and irregular in form. Somewhat coarse, but of fair quality for so large an apple, and of good sub-acid flavor. Webster.

399. Krimskaja Seloka;—Green Crimean;—Tree not thoroughly hardy and of value only for cooking. Hoskins.

402. Borsdorfer;—Borsdorf;—This is a German, rather than a Russian apple and a member of a large family. This tree has proved hardy and a good bearer with Mr. Webster. Both Mr. Tuttle and Mr. Sias say that the tree is hardier than the Fameuse. The fruit from Mr. Webster's description is small to medium, of fair appearance, firm and of fine texture, sub-acid, rich and good. Dr. Hoskins says, when perfect, it looks very much like Ben Davis in form and color, but smaller. It is a first-rate keeper for home use, although rather small for market.

407. Tchernoe Drewo; Blackwood;—A favorite winter dessert apple which sells for extra prices on the Volga on account of its fine quality. If picked early and stored in a cool place it keeps till winter or later. With Mr. Webster it ripened early and did not seem of special value. Mr. Tuttle says;—It blights. Mr. Sias says "good tree."

410. Repka Malenka; Little Seedling;—Mr. Oliver Gibbs says that this is like Duchess in form of the tree. He has seen it in Carver County, in perfect health, through growing close to other trees badly blighted. It is an abundant bearer, fruit small; quality unknown at that season. Mr. Webster speaks of it as an enormous biennial bearer, and if thinned it attains a fair medium size, and that it is too hard to be eatable till warm weather in Spring, when it becomes tender, juicy and of fair quality and flavor. Mr. Sias says that at the winter meeting of the Minnesota Horticultural Society, at Minneapolis, it was the best keeper shown. It tasted fresh and tart as if just picked from the tree.* I saw this apple at Mr. Underwoods. It seems to be of the same family as the Bogdanoff, judging by its leaf, as pointed out by Mr. Budd. The Repka of Ellwanger and Barry, received from Moscow, is a summer apple.

413. Skrischapfel; Cross Apple;—This I saw in the orchard of Mr. Underwood at Lake City, Minnesota. It is without doubt an Anis of the true Red Anis family. It was top grafted on crab, as is apt to be the case, and I was dissappointed with the flavor of a prematurely ripened specimen. Mr. Oliver Gibbs writing to me in November, says: "That apple you saw at Mr. Underwood's and thought might be Anis only for its lack of quality, turns out, when

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This refers to the plate exhibited by Andrew Peterson.—*Secretary.*

ripe, red, high finished, good and apparently a keeper. It is undoubtedly the Red Anis." The summer heat of southern and central Minnesota in Lat. 44 and 45 is no doubt much greater than that of the Upper Volga from Lat. 52 to above 55 and we may expect to find the fruit of that region proportionately earlier in its season of ripening. [This apple failed to keep. It grew suddenly mushy in December, but possibly owing to some peculiarity of the soil or season, or from its being grown on an uncongenial crab stock.]

Dr. Regel speaks of the Skrischapfel as an excellent yellowish green fruit that keeps till the following summer, and says that the tree endures the coldest winters at St. Petersburg, and I must say that the colored plate of it in Dr. Regel's book is very like the Skrischapfel at Mr. Underwood's. Mr. Schroeder, Moscow, gives a like description of Skrischapfel, but what we saw in Russia seemed a more solid, weighty, apple than that growing at Mr. Underwood's.

429, Bosklonowka; Bosklonoff;—Sweet, bitter and worthless. (Webster.)

433. Orlowskoe; Orloff;—Mr. Tuttle says this is White Astrachan That received from Ellwanger & Barry, fruited by myself and Mr. R. W. Shepherd of Como, Quebec, seemed to be White Astrachan. Ellwanger & Barry received from Thomas Rivers, of England.

437. Sachoiswan; Saxonian;—Striped on yellow ground. Season, late fall.

439. Krimskaja Beel; White Krim;—This is Duchess—says Mr. Tuttle.

441. Grimuschka; Rattling;—One specimen I saw at Mr. Underwood's. A large brownish red fruit.

444. Reinette Liubski; Lubsk Queen;—A very beautiful little sweet apple of no value, says, Mr. Webster. Mr. Tuttle says, although reported from the east as sweet, he finds it sub-acid. He adds further, that it is a very good fall apple about the size of Autumn Strawberry.

448. Kardinal; Cardinal;—That which I saw at Mr. Underwood's was small, striped, and of fine flavor. Dr. Hoskins describes it as a red cheeked apple, on dull, whitish green ground,—but he received his from D. W. Adams, of Waukon, Iowa.

450. Beel Krasawiza; Handsome White;—An apple of white Calville form and size, acid, crude and unripe, as I saw it in the orchard of Mr. Spaulding, at Minneapolis.

451. Warschtapel; Wartztappel;—At Mr. Underwood's. An apple of full, medium size, green with some faint red, very ribbed and wrinkled.

453. Arkad Krasiwai; Beautiful Arcade;—A hard white apple, somewhat juicy, sweet and with some flavor, which Mr. Tuttle thinks very favorably of.

455. Riabinouka; Berry Aapple;—The Riabinouka as grown by Dr. Hoskins was received from D. W. Adams, Waupon, Iowa. An apple very, closely resembling Alexander, though Dr. Hoskins and others agree that they are not alike. Yet Dr. Hoskins says, there is no use in growing both; he finds the tree not perfectly hardy.

457. Klinewskoe; Klineff;—Mr. Tuttle says, fruit of medium size, yellow with red cheek. Season, fall.

458. Scholtinaliv; Yellow Juice;—Dr. Regel says this grows in the gardens of St. Petersburg, Novgorod and the Coast Provinces, and is often mistaken for White Naliv. It is quite suited to these climates and bears lots of fruit each year. It ripens in September, and keeps till November.

462. Rubez Sclonniu; Greencut;—The Rubets Sclonui, Dr. Regel says is grown in the Coast Provinces, also at Moscow and southward; also, says Baròn Tiesenhausen, in the Province of St. Petersburgh. It is a medium sized fruit, yellowish green with a little red on one side. Good for cooking only. Tree healthy but not productive.

463. Pipka Postillnaja; Spreading Pipka;—A small apple of Duchess type, sour, dry, flaverless, condemned, (Hoskins.)

469. Babuschkino;—Grandmother;—Judging merely from the leaf, as examined by Mr. Budd, this would appear to be the same as that received by him from some other places in Russia.

Dr. Regel says that he received the Babuschkino from Moscow and that it is grown in that province and the provinces to the south. It seems to be an apple of full medium size, yellow, with a little red. It has an agreeable, vinous acid and aromatic flavor. Dr. Regel recommends it as a fine dessert apple, said to keep till August of the next year.

472. Ostrekowskaja Steklianka;—Ostrekoff's Glass;—This I saw in the orchard of Mr. Underwood. A small, green apple, very conic and very wrinkled at the calyx, and without basin. Its length of stem I forget. Mr. Shroeder, at Moscow, describes it to me as a small, dark green apple, with dull, red sides; conic, with corrugated basin and long stem. He says the tree is hardy and that it is even a good dessert apple, and keeps till the following summer. Dr. Regel, in his work, seems to describe the same apple as a hardy tree and a heavy annual bearer, and says that it is a fruit of medium size, a native of Tula, and named after a merchant there. Mr. Budd, on reading my description, queries whether this may be the same as the Astrachan Pippin, which he received from Moscow, which, however, Mr. Budd says "is a true Steklianka and the keeper of all the keepers I have yet seen from Russia." Mr. Budd says that he took that apple to the Iowa winter horticultural meeting, jammed in a valise full of books, but it arrived sound and too hard and crude for eating. We saw just such apples in Russia, and carried them about with us to try to find out their names. The cut of this apple, herewith given, is very unlike the fruit grown by Mr. Underwood. It is from a drawing taken in the department grounds by Mr. Wm. Saunders. [The Ostrekoff Glass reported by Andrew Peterson, of Carver county, is probably untrue to name. His resembles the Lieby and the Hibernal in fruit, while all others who are fruiting from this name and number, (472) so far as heard from, describe it substantially as here given by Mr. Gibb.—SECRETARY.]

476. Arkad Rother;--Red Arcade;—Dr. Regel says that this originated in the government of Echernigov; a very scarce apple which he only saw from one garden there. He says further that it is doing well in his pomological garden at St. Petersburg, and speaks of its beauty and long keeping qualities, yet strange enough it is not on the list which Dr. Regel recommended to us for trial, nor even in his general catalogue, nor was it among the apples he sent to Mr. Budd in 1879. Dr. Regel may have lost it.

Mr. Saunders at Washington does not become enthusiastic over it: he merely says good early apple, fully ripe 4th of July. The word *Rother* would seem to imply German habitat.

477. Roschdestwenskoe;—Christ Birth Apple;—That grown by Ellwanger and Barry, of Rochester. was received from Moscow, and would hardly seem by the description to be the high conic, long stalked apple described by Mr. Shroeder. It is a valuable winter apple in Russia, and I would like to hear of it having been fruited from the department catalogue.

Dr. Regel speaks of this as grown at Novgorod and to the south of Moscow. A green and afterwards a yellowish green fruit dull red in the sun. Flesh white, juicy and agreeably sour, with slight aftertaste. Ripe in October and keeps all winter. It stood the severest winters until 1866, when young trees suffered. This tree will not endure 30 Raumur--that is 35½ below zero Fahr. This apple may have taken its name from the village of Roschdestvenskago.

490. Glimzowoe;—Clay;—Mr. Spaulding says like Duchess, in tree and fruit, but it seems finer in grain, is less sharply acid, and a month later in season.

502. Russische Rambour Reinette;—Russian Rambour Queen;—Mr. Tuttle says in form and color like Rhode Island Greening, but larger. Quality good. Season early winter.

544. Lapouche Naliw; Juicy Burr;—At Mr. Underwood's, a large striped apple like Duchess.

548. Borowinka Lugouaja; Meadows Mushroom;—Large, aromatic, and good, says Mr. Saunders at Washington.

551. Arbusowskoe; Water Melon;—Mr Sias says: a fruit nearly as large as the Duchess, and looks like it; fair in quality, but so far, a shy bearer. The specimen I tasted was woody. Mr. Tuttle says, fruit large, yellow with red cheek, mild, sub-acid. Season, late fall.

Dr. Regel quotes the opinions of Mr. Miller, to show, that this apple has been grown at Moscow, and southwards, and has probably been named after Mr. Arbusov, a merchant. It is a large oblong apple, about the largest pictured in Dr. Regel's book. The skin is green and afterwards a yellow green, the largest part of the fruit being covered with a dull red, with darker marblings. The flesh is greenish white, and of an agreeable sour taste. A large, fine looking, dessert and cooking apple, which ripens in September and keeps till December. It has stood the test of hardiness very well with Dr. Regel. Only old trees suffered during the very severe winter of 1866-7.

563. Krimskoo Nalivnoe; Juicy Krimtartar;—Mr. Tuttle says: a large, yellow, mild, sub-acid, fall apple of good quality.

568. Melonenapfel; Melon apple;—Mr. Saunders says, a fruit of good flavor somewhat tough in flesh, on August 16th. Judging by the outline it seems to be an apple of good size.

578. Borsdorfer Leipziger; Leipzig Borsdorf;—Mr. Sias says, one of the best in quality of the Russian apples, and one of the best keepers. It would seem however, that it is a conic apple, of no special beauty. The tree is hardy and a good bearer.

579. Tierlandischer Sommer;—Summer Lowland.—Mr. Tuttle says this resembles Duchess in appearance, but is of excellent quality. A very pleasant sub-acid. It is later in ripening, and should have been named Autumn Lowland. Mr. Tuttle speaks of the tree as very hardy and satisfactory.

580. Tierlandischer Winter.—Winter Lowland.—In Mr. Sias' orchard, this is a small flat apple, striped with bright red, white in flesh, quite good and probably a good keeper.

Erdbeerapfel.—Red Calville.—A hardy tree and an enormous bearer; fruit red, acid and high flavored, but rather small. Its lack of size prevents its being valuable.—Webster. Why the word Erdbeerapfel or Strawberry apple should have been translated Red Calville, it is difficult to say.

585. Zusow's Winterapfel.—Zusoff's Winter.—Mr. Tuttle tells me that he has two varieties under this name; one a small, bright red, fall apple, the other larger and a better keeper. He would not recommend them without further trial.

587. Englischer Pepping; English Pippin;—(See 161—Longfield.)

592. Arkad Dlimui; Long Arcade:—A small or medium sized fruit, much like Red Astrachan in form and color; flesh, white and fine grain, and a mild, pleasant acid. Season, late fall or early winter. Such is the opinion of Mr. Tuttle, who speaks of the tree as very hardy, a medium grower and an early bearer.

597. Pesolschnaja Steklianka; Glassy Sand;—A small and very conic fruit, of medium quality, basin not wrinkled, as fruited by Mr. Sias. As described by Mr. Schroeder, it is a fall, sour greening. That grown by Mr. Sias may be true to name, I cannot be sure.

600. Dlimoe; Long apple;—This evidently gets its name from the tree, which has few and long branches, thickly studded with short spurs, each crowned in season with a rosette of beautiful, little red apples, of good quality, says Mr. Webster.

874. Borowinka Sladkaja; Sweet Mushroom;—A good flavored, sweet apple, of good size and rather tough flesh, says Mr. Saunders.

965. Gruscheffka Sladkaja; Sweet Pear; Not a sweet but a fine sub-acid apple, of the Yellow Transparent class, says Mr. Webster. I saw it at Mr. Spaulding's, probably the same fruit.

966. Tuchernokrasnoe; Red Black;—Mr. Sias says, one of the most showy and beautiful of my Russian varieties, and one of the largest. Color, nearly black where well exposed to the sun. A little coarse in texture but a good market apple. Season probably October or November.

970. Tuhuginka Selomaja;—Green Citron.—Medium in size, shy bearer, not profitable.—Sias.

971. Wassilli Welikui;—Vassilis Largest.—This belongs to the same family as Green Streaked, Zolotoreff, and Turnipy Juicy. Mr. Tuttle says, it is a little more like Alexander, in color and appearance of the tree, than the others, about the same quality, and like the others an early bearer, of large, showy, fall, market apples.

973 Stekliannoe Duschisstoe:—Shining Aromatic.—Fruit of no value here, says Mr. Webster. Mr. Tuttle says, an acid fruit, rather fine in grain, and with some flavor, not bad, but we have too many such apples.

975.—Tetnekrasnoe.—Red Teat.—This tree, says Mr. Webster, is a wonderful bearer, and the fruit if judiciosuly thinned, large to very large, but of fair quality and flavor only. September. It is like Mr. Webster's Zolotoreff, but not so good in quality, nor does it seem to keep as long.

978. Beel Solotofskaja.—Golden White;—Dr. Hoskins pronounces this the best late fall apple among the Russians, for market purposes; St. Peter the best early fall. Dr. Hoskins descrbes it as medium in size, round, with no cavity. In color, a dull, pale green, turning to a dull yellow, with a few pale red stripes in the sun. Many specimens have no red at all. The flesh is soft, a little coarse. Flavor, a very sub-acid. Mr. R. Brodie of Coteau St. Pierre exhibited in Montreal last September, a plate which seemed this variety. He has five trees of it, planted about five years, and the trees seem extra hardy, and a good young bearer. The samples shown were a good deal above medium in size, and some samples grown by Mr. Brodie have been very nearly as large as Alexander.

981. Beelowoe Scholtoseroe;—White Russet;—Mr. Tuttle says a large, yellow apple with a red cheek, a little russety around the stem. Quality good. An early and abundant bearer. Season late fall.

983. Astrachanskoe Skwasnoe;—Red Astrachan;—Not Red Astrachan says Mr. Spaulding. It should rather have been translated, Transparent Astrachan.

984. Anis Kurski;—Koursk Anisette; I saw this at Mr. Underwood's. A small, green fruit without any basin and very wrinkled at calyx, not of Anis type at all. Dr. Regel received this from Penza, but does not describe it. Mr. Sias says that it resembles Russian Green, of fine quality and keeps pretty well for a fall fruit. Evidently not the same apple as Mr. Underwood's.

985. Anis Krasnui;—Red Anisette;—A true variety of the Anis. When I saw it in August in Mr. Sias' orchard, it was not fully colored, and, in fact, it seems to have more color than the Yellow Anis growing along side of it. Not the Pink Anis we saw on the Volga.

987. Anis Schaltui;—Yellow Anisette;—This also is a true Anis. When I tasted it in Mr. Sias orchard, it was hard in texture and a crude acid. But Mr. Sias says that it does not keep past September. These were top grafted on Crab. Mr. Sias tells me that he has found in his neighborhood trees grafted o apple roots, planted in 1881. The trees seem in perfect health and the fruit about a third larger than that grown on Crab. The fruit, however, ripened in the fall and did not keep. This and the Red Anis above noted, and 382 Green Russian, and 413 Skris chapfel or Cross apple, are true varieties of the Anis may prove of great value in the far north.

988. Ananasnoe;—Pine;—Like Yellow Transparent at Mr. Underwood's.

PHYSIOGRAPHIC CONDITIONS OF MINNESOTA AGRICULTURE.

By Prof. C. W. Hall, of the University of Minnesota.

Minnesota, the center of the continent; Area—land and water—arable—prairie—forest; Forest Trees—cut of pine; River Basins—extent of each; Altitudes of rivers, towns, lakes; Distribution and kinds of Lakes; Drift—its origin and character; Soils how formed—elements of—effect of rain; Rainfall—in the United States—in Minnesota—its relation to fruit culture; Temperature and Climate—changes of with altitude and distance from the equator; Conditions of successful farming; Forests and Rainfall.

The State of Minnesota occupies so central a position on the North American continent, that Pigeon Point, its northeasternmost extremity, is but two hundred miles nearer Eastport, Maine, than is St. Vincent, its northwesternmost point, to Astoria, Oregon; while starting from its capital city, one must travel but four hundred miles further in a direct line, to reach Bhering Straits, than to reach the Isthmus of Panama.

Its southern boundary line coincides with parallel 43° 30′ and its northern line, except for an area of about one hundred and twenty square miles in the Lake of the Woods, extends but to parallel 49°, the northern limit of the United States; to the east, Pigeon Point extends but a mile or so eastward of meridian 89° 30′, and to the west the 97th meridian line passes through St. Vincent township.

The area included within the commonwealth is so beautifully diversified in character, that of the 84,286 square miles of surface within its boundary lines, 78,648 square miles only is land: the other 5,638 square miles being made up of numberless small attractive lakes scattered over its face.*

This estimate of water surface does not include the portion of Lake Superior lying within the Minnesota borders.

The 78,648 square miles of land, equivalent to 53,943.379 acres, furnishes 45,000,000 acres which are thought capable of being brought under the plow.

This vast extent of country is further diversified by forest and prairie, giving an aggregate of near 48,000 and 31,000 square miles respectively, and exclusive of the water area. Although the forest regions lie chiefly to the northeast and the prairies stretch away with broader expanse to the south and west, yet the division is by no means sharply defined, large prairie districts being seen within the timbered area—as Long Prairie River valley, in Todd county, and Long Prairie in Morrison county; while the "Big Woods," a large forest belt, forty to fifty miles wide, extends from the forest regions of the north as far to the south as Blue Earth county, and belts of timber are not infrequent upon the plains, especially around the lakes and marshes and along the river courses.

Watonwan and Minnesota rivers, and Crystal Lake in Waseca county, furnish notable illustrations of this fact.

The pursuits of agriculture are gradually effecting a change in both the flora and fauna of Minnesota; the wild grasses and sedges and the brilliant prairie flowers are slowly but surely disappearing toward the west and giving place to the cultivated species already so abundant in the settled portions of the state; while the wild beasts, once valued for their rich fur and sought as food, no longer inspire terror in the hearts of the settlers and are only occasionally seen as they stray from the haunts where they have found retreat.

The forests furnish both hard and soft wood; oak, maple, elm and birch, bass-wood, soft maple and cotton-wood are found in greater or less numbers. The evergreens grow abundantly, pine taking the lead; it is to the state of greater economic value than all other trees. According to Prof. Sargent, Forestry Bulletin No. 5, 10th census of the United States, the total amount of standing pine, May 1880, in Minnesota, was 6,100,000,000 feet, board measure; while the amount cut during that year was 1,550,000,000 feet.

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*Hon H. H. Young, Secretary of the State Board of Immigration.

The original limits of the pine area upon its southern and western sides was nearly as follows: Beginning at the eastern boundary of the state a little above Taylors Falls, the line extended westward through Isanti, the northeastern part of Benton, through Morrison, Todd, Otter Tail, Becker, Polk, Marshall and Kittson counties. At the present time, much of the pine bearing land within that area has been cut over, and the above figures of lumber yield will give one of a speculative turn of mind an opportunity to calculate for himself how soon the practical exhaustion of our pine will occur,—an event which will throw upon our state large tracts of land generally considered of but little value to the agriculturist, but which will nevertheless exert their influence upon the climatic conditions of the state.

Three grand drainage systems take their rise in Minnesota; the Hudson Bay, the St. Lawrence and the Mississippi. The areas drained by these basins through their several tributaries are as follows:

The Hudson Bay—		
Rainy Lake River	11,347	sq. miles.
Red River	18,106	"
The St. Lawrence—		
The St. Louis river and other streams	7,689	"
The Mississippi—		
Minnesota River (in Minn.)	15,706	"
Tributaries of the Missouri in Southwestern Minnesota	6,399	"
Des Moines River	1,639	"
Cedar River	1,209	"
St. Croix River (in Minn.)	3,669	"
Other tributaries of the Mississippi below St. Paul	6,399	"
Mississippi river above Ft Snelling	16,596	"
Total	84,286*	"

The state is not high above the sea; the four corners give respectively the following altitudes: The Mississippi at low water mark is at La Crosse 626 ft. above sea level, Lake Superior 602 ft.,

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*The above areas were computed with much care from the last edition of Warner & Foote's map of Minnesota, and are believed to be veay nearly correct.

St. Vincent 758 ft., and Pipe Stone City 1577 ft., while along our water courses we find the following altitudes:

Winona	640 feet
Red Wing	665 "
Hastings	670 "
Stillwater	675 "
St. Paul	676 "
Minneapolis	791 "
St. Cloud	953 "
Brainerd	1200 "
Moorhead	904 "
Breckenridge	948 "
Fergus Falls	1062 "
Mankato	748 "
New Ulm	837 "

Among our prairie towns some of the highest points may be found as follows: At the summit, between Hatfield and Pipe Stone City, the highest point on the Southern Minnesota R. R., the altitude is 1744 ft. above the sea; Dodge Centre, on the Winona & St. Peter R. R., is 1288 ft.; Bird Island, on the Hastings & Dakota R. R., 1089 ft.; near Kandiyohi, on the southern division of the Manitoba, 1255 ft.; mile post 138, on the St. Cloud division, is 1403 ft.; Frazee City, on the Northern Pacific, east of Brainerd and near the divide between the waters of the Mississippi and Red Rivers, is 1431 ft.; while the Leaf Hills, a range "five to three miles wide, composed of very irregular, roughly outlined hills, 100 to 300 ft. high," stretching in a northwesterly direction from the borders of Todd county, through Becker and Otter Tail counties, and disappearing in the low range which merges into the old raised beaches of the glacial Lake Agassiz, reach an altitude of 1750 ft. above the sea; while many of the summits of these hills show elevations between 1500 ft. and that figure.

Many towns and villages nestled in the valleys, along the streams and beside the many lakes of this section of the state, often at an elevation of 1,500 feet and upwards, testify to the inviting salubrity of the crisp and bracing atmosphere.

The highest part of the state is the Mesabi—the Chippewa word for dividing ridge—the range of high land separating the waters of the Rainy Lake River basin from those flowing east and south into the St. Lawrence and the Mississippi.

The continental foldings of the earth's crust are not strongly marked in Minnesota; there are no high ridges nor deep valleys, such as are seen along the Atlantic and Pacific slopes of the continent; nor has water, along the Mesabi, exercised that wonderful erosive power so manifest among the Alleghanies of Pennsylvania and in the Rocky Mountains of Colorado and Arizona; hence this part of the state is characterized by ranges of low hills separated by shallow valleys.

This general fact becomes noticeable: Minnesota, as a whole, is a level state, the surface being made up of a southern portion of vast prairie tracts varied with wood, lake, slough and low elevation; then a central belt reaching from east to west, with timber prevailing in the eastern part, and furnishing, further west, much land of exceeding fertility but interspersed with low, swampy and often sandy and barren tracts; further a heavily rolling prairie stretches away through the western half of the state, furnishing a setting for thousands of the little lake gems which keep the air of Minnesota sweet and make the scenery far sought by summer tourists; and, finally, a northern belt, as yet unsurveyed in part, and but little known, extends from Lake Superior across the Mesabi and westward to the Red River of the North. This latter tract includes Sawteeth range and skirts the north shore, where some of the peaks reach an altitude of 1,800 or 2,000 feet above the sea level. Hence for surface features, as we pass from the river bottoms and old lake basins of the Mississippi and Red rivers and the southern portions of the state, to the higher level prairie of Mower and Martin counties, the hilly regions of Otter Tail and Becker counties, or finally to the only part which can claim the dignity of a place among the mountainous districts of the country, we may well conclude that Minnesota furnishes a richly diversified scenery.

Of lakes we have both ancient and existing, of the latter at least 8,000; Andreas gives in his latest atlas 3759 in the surveyed portions of the state, and Terry* estimates 10,000 from what he knows of the unsurveyed portions. These lakes average rather small with the aggregate area already given—5,638 square miles. Indeed, they range in size from a pool merely large enough to throw a chain carrier from his course to the dimensions of 340,000 acres in Red Lake, 130,000 in Mille Lacs and 114,000 in Leech Lake.

These lakes may be classified under three distinct types: first, enlargements of river channels, of which class lakes Pepin and St. Croix furnish illustration; formed where, through the deposition of river silt by the inflowing of other streams, the channel has been dammed up and the waters made to set back and form a large sheet; second, those having rock basins formed either by glacial erosion or through the interruption of a geological formation as shown by Lake Saganaga, on the northern boundary of the state; and in the third place the glacial lakes, of which class lakes Minnetonka and Heron are types. Lakes of the last named class are by far the most numerous; they lie in the valleys left by the moraines of the retreating masses of ice at the close of the glacial period. In shape they are more irregular than the lakes of the other classes as they fit in between or wind around the moraine ridges, as their contour will permit. We do not find them equally distributed over the state since they owe their distribution to the retreating ice sheets of the succeeding glacial waves which swept over the state, each one weaker than the preceding and constantly northward bearing till the southern limit wholly left the state, and the Red River began to flow northward and the source of the Mississippi was changed to what is now the northern central portion of Minnesota. For the origin and law of distribution of the glacial lakes, therefore, we must look to geology; the scope of this paper will only permit us to call attention to this fact, that where the piles of glacial debris lie thickest and highest, there we find these sheets of water most numerous.

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*See a highly interesting chapter on the Hydrology of Minnesota, by the late Rev. C. M. Terry, in the Ninth Annual Report, Geological and Natural History Survey of Minnesota, p. 314.

A glance at the map will show that a belt some 50 miles wide, extending northwesterly from Lake Minnetonka through Otter Tail with its 430 lakes, into Becker county, turning a right angle toward the northeast, and crossing into the Canadian dominion, will include that part of the state which contains the greatest number of lakes.

The altitude of these bodies of water is not great, as the following figures show:

Lake Minnetonka	922 feet.
White Bear	910 "
Mille Lacs	1346 "
Itasca	1500 "
Red Lake	1140 "
Otter Tail	1325 "
Lake Ida	1400 "
Eagle Lake	1125 "
Lake Miltona	1400 "
Heron	1405 "
Lake of the Woods	1062 "

Of river expansions we have:

Lake Traverse	970 feet.
Lake Pepin	664 "
Big Stone Lake	962 "
St. Croix	(low water) 655 "

And the rock bound lakes of northeastern Minnesota, show altitudes ranging from 1400 to 1900 feet above the sea.

The altitude of these lakes outlines pretty clearly the average height above the sea of the surface of the state. As a rule, the river valleys, as the Mississippi and Minnesota, are narrow and then bluffs rise abruptly from them, hence they can form no large element in striking an average of altitude; so too with the hill regions. Some peaks of the Leaf Hills measure from 1,400 to 1,750 feet. The Sawteeth peaks sometimes reach 2,000 feet or more. The Mesabi probably in no case reaches 2,400 feet. A careful study then of the foregoing altitudes, with an inspection of the charts of altitude* lead to the conclusion that the state will average, not far from 1,200 feet above the sea. Nearly all the prairie region of the southern half of the state lies between 1,000 and 1,400 feet altitude, and it is only in the southern counties where the altitude exceeds the last named figure. These highest portions of the state seem to owe their height to the drift, a deposit which has several times been mentioned in the foregoing pages. *The Drift* is a material which has been deposited over nearly the entire state through the agency of ice. These masses of ice, whatever may have been the cause which produced them, whether it was the precession of the equinoxes or the earth's inclination to the ecliptic, or the elevation of the earth's crust to an extraordinary height, or whether it were neither nor all of these, but rather, a hair or two, so to speak, from the tail of Donnelly's comet, the results, as we see them today, have a far-reaching effect upon the agriculture of our state. The depth of the deposit is quite variable; it lies much thicker over the western half of the state than over the eastern, where the underlying rock is frequently seen exposed along the streams and in the hillsides; in the western part the rocks in place are almost never seen except in the river valleys where running water has laid them bare by removing a considerable thickness of overlying drift material. Another means of estimating the thickness of this drift is furnished in digging or boring wells. Frequently 150 feet or even more of sand is passed through in the western part of the state in sinking a well, while in the eastern half, 30 or 40 feet will bring one to the limestone or granitic beds beneath. And there are two portions of the state where no drift appears: these are Pigeon Point, in the northeastern and a section in the southeastern corner of the state, comprising Houston county and part of Winona and Fillmore counties. Various conjectures have been offered for this phenomenal occurrence of bare patches in the midst of a drift covered region, like islands in the sea. Among the latest theories is that of Professor Chamberlain, of Wisconsin,* who suggests that that part of the broad continental ice sheet crossing Iowa from the northwest, in passing over the elevated ridge of Keeweenaw Point and the Wisconsin Highlands, was thinned out and held back till its force was expended and the ice mass melted before this driftless area was reached. As the ice sheet on either side of this high land moved on unintercepted, the lobes flowed together and again formed a continuous mass. But Pigeon Point is narrow and the hills around Grand Portage abrupt, hence the drift accumulations left upon the rocks in that corner of the state, have been almost wholly washed into the lake by the snow and rain of a few thousand years.†

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*The charts exhibited were prepared from data collated by Mr. Warren Upham.

"In listening to your lecture before the Horticultural Society, I noticed one assertion made by you, as before by Prof. Winchell in the first volume of the final report of this survey, now in press, which I cannot agree with. This is, that a considerable tract north of lake Superior in the extreme northeastern part of Minnesota is *destitute of glacial drift!!!* To be sure, the deposition of drift there is by no means so great as in central and western Minnesota; indeed the bald rocky hills (like the surface in extensive tracts near Salem and Lynn, Mass.) appear to have been swept by the moving ice-sheet almost as clear of all surface material as possible, leaving the same only in the lee of the jutting ledges and hills of rock. But in my opinion it is *very erroneous and misleading* to call that a "driftless region." ALL THE MATERIAL THERE IN WHICH TREES AND VEGETATION TAKE ROOT MUST BE GLACIAL DRIFT, and of course timber and herbage cover all that is not bare rock. We have such tracts among the hills in some parts of New Hampshire; and I have no doubt that in some of the sheltered places in the lee of hills of rock and in hollows between ledges, the glacial drift in that northeastern part of Minnesota occurs in depths varying from a few feet to even fifty feet."

The character of this deposit varies considerably. By far the larger part is what is denominated by geologists, "Till." This is a term used "to designate a compound mixture of bowlder, clay, gravel and sand, formed by glaciers, constituting their ground moraine." In Stearns county, bowlders of enormous size are seen, sometimes weighing hundreds of tons. And all over the state wherever this Till occurs, bowlders of various sizes from the masses mentioned down to mere pebbles are abundant. If we examine the walls of a railroad cut or a water-worn gully by the road side, we shall see a confused mixture of gravel and sand, and quite likely diminutive beds or lumps of clay or perhaps the bowlders, gravel and grains of sand are packed into a matrix of clay. Sometimes the material is assorted or stratified, a condition produced by the action of water and evidently during the retreat of the glacier and while the water formed standing pools or lakes. These stratified layers, especially of sand and gravel, are frequently recognized in well digging by the sudden inflow of water. These stratified or bedded layers are of great extent, often overlying the Till, and are of much economic importance to other classes than the agriculturist. The brick and pottery clay as well as the building sand of our state come from this source. In color this drift is blue in the western part of the state and red in the eastern. Not only the red color, but the scratches upon the rocks where these are laid bare and are legibly preserved, as well as the general trend of the hills themselves, point to the red sandstones and conglomerates of the Lake Superior basin as the source of much of the material of those red beds; while the chains of hills in the western part point as clearly to a northern source of the material constituting their mass. Attention is called to this drift, because it, with the decaying vegetable matter upon the ground, is the source of the soils in all the drift covered parts of our state. Since, as a general proposition, it may be stated that the mineral constituents of all soils are derived from disintegrated rocks, it is evident that soils may be found either where the rocks are decomposed, *in situ*, or where running water has deposited this material which is the result of disintegration. In either case since there is so little variation in the composition of vegetable mould, the soil preserves the general characteristics of the rocks from which it is derived, its fertility depending upon its depth, fineness, proportion of mould, etc. A soil formed from a limestone will grow luxuriant grass and form a paradise for flocks. A granitic country is rather barren through the slow disintegration of the rocks, except where the valleys hold the accumulations of long periods for the use of the farmer or the gardener. Sandstone tracts possess the natural conditions for fruit culture, and Ramsay* emphasizes the fact that in Great Britain the fruit "orchards celebrated for cider and perry, lie for the most part on the structures of the old and the new red sandstone;" and he adds: "What may be the reason of this relation I do not know; but such is the fact, that soils composed of the New and Old Red Marl and Sandstone are generally better adapted for such fruit trees than any other in Britain." The clays are the soils in which the hop vine and the cherry flourish. But here with us, through the agency of that original Minnesota plow, the glacier, all these different types of soil are mixed in utter confusion so that granites and schists, sandstones, clays and limestones have been ground together and mingled until all conspicuous characteristics, all individuality, has been lost; color has been changed — the red of Lake Superior sandstone has become paler while the blue of Cretaceous and Tertiary beds has lost its tone and a dark color is given by the growth and transformation of the vegetation of many years. Possibly the blackening of our prairie soils is owing to the frequent fires which sweep over them.

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*Geol. of Wis., Vol. I, p. 270.

†After the MS. of this paper was prepared for the press, the following postscript to a note was received from Mr. Warren Upham, Assistant Geologist on the Geological and Natural History Survey of Minnesota:

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* Physical Geology and Geography of Great Britain, p. 570.

The great advantage of this interchange of conditions lies in the wide diversity of crops it allows. Grasses and grains, fruit, flax, and amber cane can be grown side by side, and a full yield of each may be expected and that for many years without renewing the soil.

Yet plants will not take these mineral substances in the forms in which we see them.

The wheat plant will not stiffen and support its head with the silica as we see it in the quartz crystal and in the quartz grains of the granite, nor will the Indian corn take the phosphoric acid, the potash and the magnesia so necessary for its perfection, in the form in which those substances usually come to us; but decomposition, solution and recomposition are necessary, oftentimes, to bring them into the proper service of the plant. As water is the universal solvent, so powerful in its action that nothing known to man can resist it, as it occurs everywhere in the air and upon the earth, as well as within the firmest known rocks, it is natural to look to it as the most powerful agent in the preparation of the rocks for the growth of plants.

The conditions which influence rainfall are numerous; among them proximity to the sea, altitude above its surface, level or broken condition of the face of the country and direction of the winds furnish some of the principal causes which influence humidity and its precipitation.

Situated as Minnesota is, at a long distance from any mountain system, and at an even greater distance from the sea, with a level surface, and lying midway between the equator and the pole, the rainfall cannot be great; nor can it under the same conditions be strikingly small.

We find from an inspection of rainfall statistics of the United States census for 1880 that our annual fall is very near the average of the whole United States. That report gives the average for the United States, exclusive of Alaska, as 29 inches, very nearly, while a record kept by Wm. Cheney, at Minneapolis, for the last eighteen years, gives 28.27 inches as the average.

The north and west portions of the state, however, show a fall somewhat less than this, according to the census report above referred to. An inspection of the tables arranged by Mr. Schott and published in the Smithsonian Contributions, vol. 18, discloses some other interesting facts, among them that the least amount of precipitation for any year was in 1864, with but 12.06 inches at Fort Ripley, and 14.86 inches at St. Paul, while the wettest year was in 1849, with 49.64 inches at St. Paul. The next great annual precipitation was in 1881, with 38.76 inches. The extremes are 57.63 inches apart.

If we turn to Iowa we find that within the same period the dryest year was 1882, with but 18.58 inches of rainfall at Sioux City, and the wettest 1858 with 65.90 inches at Fairfield, while but 19.81 inches fell at Fort Ripley in that year.

Passing toward the gulf we find the average to be, at

Davenport	39.5	inches.
St. Louis	42	"
Memphis	49	"
Vicksburg	55	"
New Orleans	60	"

These figures show that the nearer the Gulf the greater the rainfall, and prove that where no disturbing influences are present, precipitation is most frequent where evaporation is most abundant—one of Nature's grand laws of compensation.

Let us carry the comparison a step further, this time toward the east, and into the great fruit raising state of Michigan. The highest authentic record was in 1858, of 52.42 inches, at New Buffalo, preceded by 52.06 inches, at Grand Rapids, in 1855, while the minimum measure was 11.70 inches at Fort Mackinac, in 1851, and an average of 26 inches in the "Fruit Belt," so called, which gives a showing to the effect that fruit culture does not depend upon excessive precipitation.

Of the two feet four inches and more of water, which year after year falls in this state, in a vast sheet over our 54,000,000 acres of land. giving over 21,600 barrels of water to every acre, an average of 16,250 or more than seventy-five per cent. sinks through the soil and into the earth to be carried off in subterranean streams; at all events it never appears in the discharge of the rivers draining the state, according to the best of capacity measurements thus far made. These streams carry away only a fraction over twenty-four per cent., if the records of Humphrey and Abbott are taken as a basis of estimate. While rainfall remains the same from year to year the discharge through streams is becoming less. The water which remains to work its way through the soil and underlying rocks, after taking solvents from the air, and additional solvents in the way of acids and alkalies absorbed from the soil, has its disintregating powers vastly increased.

When we see the firm granites, schists and limestones crumbled and transformed, as in the Minnesota and Mississippi valleys, there can be no wonder that this drift material with its bowlders, pebbles, gravel, sand, marl and clay, in its porous condition, is being rapidly pulverized and its lime, magnesia, potash, soda and ammonia in their various compounds, making the sum total of plant food, are imparting to the soil that variety of composition so essential to the best results in a diversified agriculture.

Where these subterranean streams formed beneath our state flow, before they find their way to the universal ocean, is not for us to know nor to speculate about at this time. Many of them appear in springs so filled with mineral matter as to be hard or alkaline; others have properties so pronounced that they are much prized for their medicinal value.

Springs of soft water are rare here; the reason for this is hinted at above.

The temperature of Minnesota is another subject of vital importance to the agriculturist. Our 10,000 lakes form a vast reservoir of heat of which a single computation may give a more definite conception. According to Terry* the lakes will give an average, taken at their highest temperature, of about 75°, or 43° above freezing point. Ten feet may be taken as a fair average of depth for the 5638 square miles of water surface, thus giving 10.68 cubic miles of water. Each cubic foot will contain about 1,250,000 foot pounds of heat, or heat enough to raise a weight of 1,250,000 pounds one foot from the earth, thus giving to the whole bulk of water the enormous power of 1,962,639,360,000,000,000 pounds! In other words there is heat enough stowed up in our Minnesota lakes each summer and given off during the cooling autumn to

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*Geol. and Nat. Hist. Sur. of Minn., 1880, p. 314, *et seq.*

raise a block of granite as large as a township and 100 feet thick to a height of over 800 miles above the level of the sea.

Yet with all this stored up heat, representing a power compared with which that at the same time buried in the earth is as a Corliss engine beside a mere toy, our climate is subject to sudden changes. With nothing to break their course the northerly and northwesterly winds are cold—those of winter sweeping down over the prairies of Dakota, extremely so. The difference between the warmest summer day and coldest winter night is about 120°. Our average temperature for the 18 years ending with 1883 was, according to Mr. Wm. Cheney, 42.52°. With this general average we have an average January temperature of near 12° and a July average near 71°, which latter figure certifies to a climate capable of ripening the finest grapes. But the averages are not what the farmers fear; the sudden changes and the *minima* are destructive. All parts of the country away from the seaboard are subject to these abrupt variations, yet the climate is affected but slightly by them. The two factors having a constant climatic effect are—distance from the equator and elevation above the sea. According to Prof. Samuel Haughton* the variation for our latitude and longitude is 2.20° Fahr. for each degree of latitude, a co-efficient which is true for only a small part of the earth's crust. For if we pass north or south, east or west 10° a different coefficient is found. So, too, in the variation of the temperature with the altitude the co-efficient is found to vary with different continental areas and even with different parts of the same continental area. For the central position which Minnesota occupies, the reduction in temperature must be taken at about one degree for every 350 feet altitude. For example Chatfield, at a height of 1285 feet, will average, other things being equal, nearly two degrees colder than Winona. But the exposed situation of the former and the protected situation of the latter, no doubt make a greater difference than mere altitude would suggest.

Both rainfall and temperature are modified by other circumstances than altitude above the sea, geographical position and direction of mountain chains. The condition of the soil and the distribution of forest and prairie, must be taken into the account. Prof. Aughey, in his work entitled Sketches of the Physical Geography and Geology of Nebraska, points out the gradual increase in the rainfall of that state due to breaking the prairies and making the soil lighter and more porous under the plow. By this means much of the water which formerly ran off the hard, well trodden sod, as from a roof, is now held absorbed by the earth until it is removed by evaporation and filtration into the rock strata below. The Professor also calls attention to the fact that the streams are becoming larger and that springs are now flowing where once water could not be obtained.

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*Six Lectures on Physical Geography, Dublin, 1880, p. 108.

The question as to how much the cultivation of the soil changes the climatic conditions of any part of the globe is a large one, too large to be settled by one or two facts. Were that not the case we should need go no further than Nebraska and Minnesota to elaborate a law. For it has been stated that the average rainfall at Minneapolis for the past eighteen years was 28.67 inches; while that at Fort Snelling for the eighteen years between 1837 and 1854 inclusive, was 25.30. Great caution must be exercised in generalizing from statistics of any sort, and it will take more than two states or a few decades to establish a law governing all.

Briefly there have been enumerated some of the physiographic features of our state which affect the energies of its people and their industries, and most of all, agriculture, in its several branches.

The three conditions of success in farming are: climate, soil, and cultivation. It has been the aim of this paper to consider only the first two and some of the conditions and attendant phenomena which cluster around them.

These questions of environment must be faced by the farmer, and his relations to them clearly understood.

The following question was asked by an auditor:

Do not collateral observations show that tree culture promotes humidity and increases rainfall and also decreases the liability to sudden changes of temperature?

Answer:

The experience of European countries and of the Atlantic Coast States and Canada has called special attention within the last ten or twelve years to the climatic influences of forests. Investigation has thrown much light upon the subject during that time. Still enough is not yet proved to silence all questioning. As clear a thinker as Aughey, in his Physical Geography and Geology of Nebraska, already referred to, says: "The statistics of forestry in the east, in Europe, in Asia, show that forests modify temperature, the violence of winds and equalize rainfall but do not increase it,'

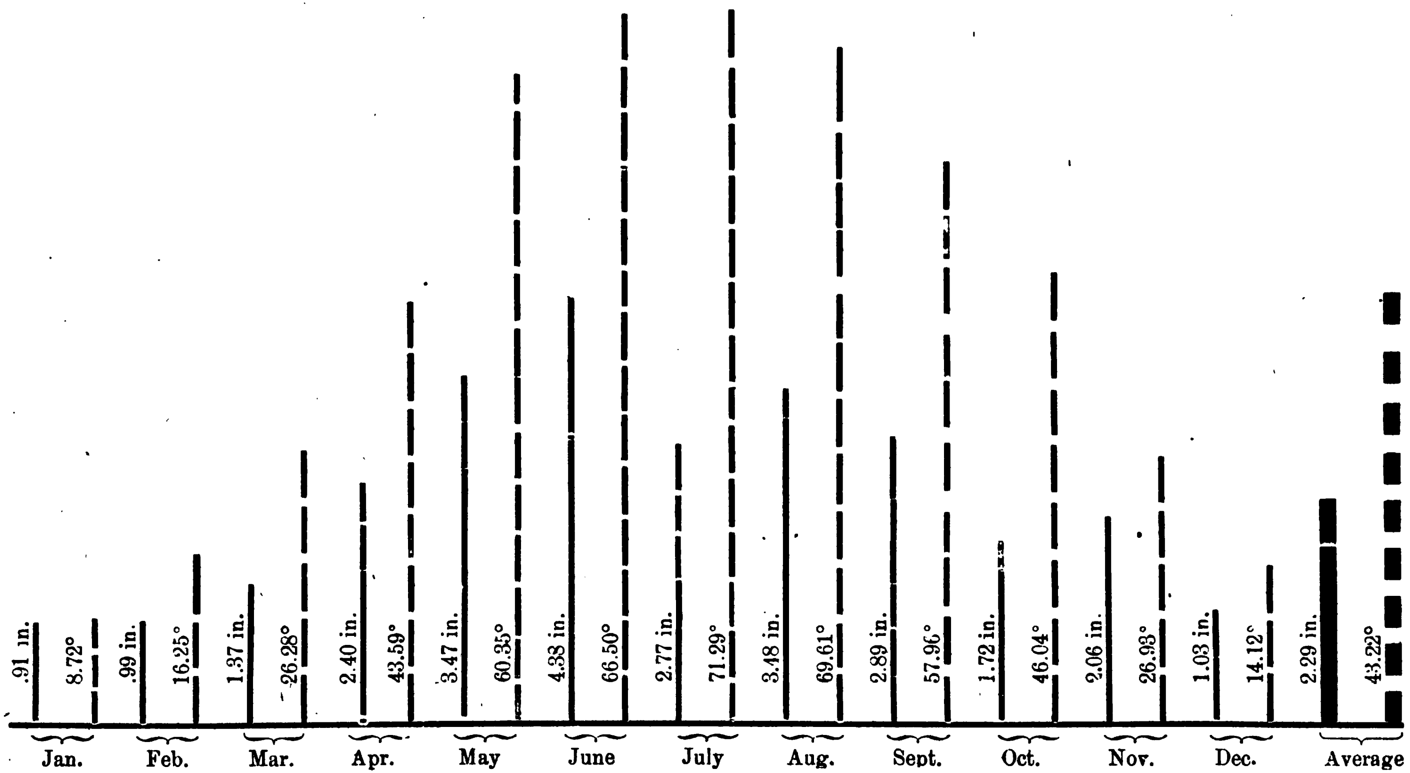

FIG. 1 Showing the average rainfall of each month for the period of twelve years, scale one-half, and the average temperature of each month, for the same time, in Fahrenheit degrees.

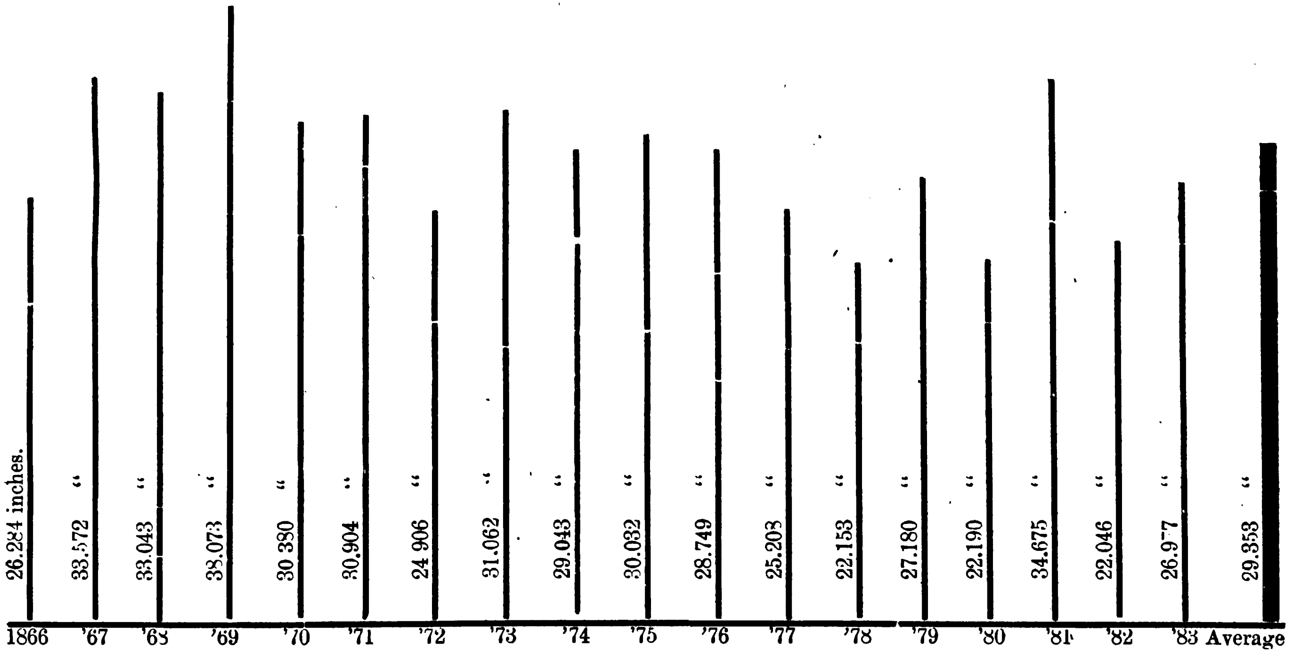

FIG. 2. The annual rainfall at Minneapolis, according to the records of Mr. Wm. Cheney, for the past eighteen years, and the average, per annum, for the same time. Scale, one-twelfth.

(page 44.) He further emphasizes the fact that we must increase the absorptive power of the soil to cause an increasing rainfall.

On the other hand, in France experiments have been made which seem to prove, for that particular locality, that forests have a direct influence upon the supply of atmospheric moisture and rainfall. In one instance, the result of six months' observations showed the difference in rainfall in favor of the forest and against the open country was 8 per cent. and in atmospheric moisture was 1.3 per cent.* It is clearly apparent that forests make the soil light and porous, whereas prairies have a firm and compact soil; forests produce coolness and dampness of the atmosphere and hence rain, whenever warm and cool currents come in contact. So far as forests maintain coolness in the air they prevent that intense heating which is the first condition of a cyclone, Yet terrible wind storms occur in wooded districts, and to the north of the cyclone belt, as the almest impassable windfalls in northeastern Minnesota show. These two considerations mentioned seem te be uppermost in the minds of farmers in discussing the subject of tree culture; but a third, which seems to me to be of equal importance, has just been stated by Mr. Phipps. of Toronto: "There is nothing now better known to the world of science than the fact that any deforested country will cost the cultivator at least four or five dollars more per acre to obtain the same crops which nature would have assisted him to procure had a proper interspersion of reserve remained to continue the natural moisture and preserve the natural fertility of the soil."† Such a statement appealing so strongly to the farmer's pocket and announcing so heavy a tax upon his capacity for work should be rung in the ears of every tiller of the soil until all responsibility can be left with him. Therefore the briefest answer to the question is, *Yes.*

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*Popular Science Monthly, June, 1875, p. 20.

†Report on the Necessity of Procuring and Replanting Forests. Compiled at the instance of the Government of Ontario, by R. W. Phipps, Toronto, 1883. A work which should be in the hands of every farmer in Minnesota.

IMPROVEMENT OF FRUIT TREES BY SEEDLING CULTURE.

By D. A. Robertson, of St. Paul.

The growing of apple trees of Russian origin in the climate of Minnesota, having been established by successful experiment, gives assurance of future success in producing improved seedling varieties of standard trees of pears, cherries and plums, which may be grown with the same success as apples.

We should follow the example of Russia, where the climate is so nearly like our own, by producing new varieties of superior quality, from a selection of our own home grown seedlings, and no longer depend upon foreign born trees. In this way only, have all the orchard fruits (and all other edible fruits and plants) been improved from their wild, original ancestors, to their present noble types of civilized excellence. Trees of warm winter climates can never be naturalized to a very cold winter climate, or naturalized at all in distant regions, without losing some of their best qualities. To become perfectly naturalized and thoroughbred in any change of surroundings, trees, like animals, must be born again as seedlings, and of all plants, this is most positively observable in fruit culture. Unlike annual and herbacious vegetation, we cannot, without much greater expense than profit, invent means to shelter our standard trees from the severest cold of our winter months, and we must not forget that in our coldest winters, which recur every few years, the temperature as indicated by the Fahrenheit thermometers, occasionally, in some parts of the state, sinks as low as 40 degrees below zero, and in the extreme north of Minnesota to some degrees lower. Temperatures as low as these do not prevent the healthy and fruitful growing in Russia of the standard orchard trees just mentioned. These Russian trees are the result of successive improvements in seedling culture. It should be mentioned, that by judicious forest tree protection, our climate will no doubt become, before very many years, greatly ameliorated, and then our orchards will be much less exposed to the meteorological severities of the different seasons.

As my present purpose is to show that our surest way to the highest possible excellence in fruit tree culture, is by systematic and successive improvements in the growing, fruiting and selection of seedlings, a brief notice of the progressive history of American fruit tree culture may not be without some entertainment for those who have not considered this subject.

The original standard orchard trees of this country, as the apple, pear, cherry, peach and plum, were nearly all imported from Europe during colonial times, and some of them as late as in the beginning of this century. As the expense of importing these European trees, which were mostly of the best grafted kinds, was greater than nearly all the New World farmers of that time could afford to pay, and as these farmers generally desired the luxury of orchards, they were compelled to depend for increase of trees upon the planting of seedlings, which costing little, became very numerous and extensive. The seedling fruits were, of course, generally very inferior in quality as compared with those from the original grafted European trees. The foreign importations of fruit trees were chiefly from England, the native country of most of the colonial settlers, to which must be added the lesser importations of the German and French old settlers, and the importations of amateur fruit growers, in later years.

But the most interesting and important fact in this survey, is, that if nearly all the colonial farmers had not been compelled by their pecuniary necessities to resort to the growing of seedlings in order to become able to plant any kind of orchards, the United States would not have produced the great and most splendid varieties of standard fruits, which now distinguish this country, above all others for their superior excellence. From the vast number of seedling orchards thereby introduced, all the best American varieties were obtained, and by graftings, scattered broadcast throughout the old states. With these graftings, and the consequent great increase of commercial nurseries, the nursrymen were able to supply every demand, until it was discovered that the approved varieties furnished by the old commercial nurseries were not adapted to the climates of our extreme northwestern states. This was a fortunate discovery for Minnesota. These more western states are compelled by climate, as were the colonial farmers by pecuniary necessities, to resort to the growing of seedlings to obtain the varieties best adapted to our climates, and for the greatest possible excellence. In this grand work our North Star state is the pioneer, has taken the lead and, I doubt not, will keep it, and achieve the greatest honors and most substantial rewards; extending its list of apples from the beautiful and excellent early winter variety, the Wealthy—in whose production our state has been so much honored and benefitted by Peter M. Gideon—to the acquisition of long keeping kinds of the apple of equal beauty and quality, and other species of choice fruits common to northern climates in the older settled parts of the world.

Bnt to obtain valuable seedlings, it is necessary to procure good, plump, healthy seeds from good fruit of vigorous and hardy trees of northern growth. These seeds must be carefully selected, from both Russia and the northeastern regions of this country, as the chief sources of our supply; and from our home grown trees, grafted and seedling.

The apple seeds sold by the seed merchants should be universally condemned as worthless. These seeds are almost all obtained by washing them out of the pomace of the cider presses of the Atlantic States, where the diseased and unmarketable apples are refused and cast aside for the manufacture of cider. Such seeds are utterly worthless for seedling culture, and wholly unfit for root grafting. Minnesota should not follow the example of the old commercial nurseries. whese apple roots for grafting are grown from the seed of the cider presses, the consequence of which is the cause of general complaint of increasing failures of apple tree growing for profit, in the old apple growing states.

A few other suggestions in regard to the improvement of fruit trees by progresive seedling culture, may be briefly stated to close this subject for the present, although many other kindred topics present themselves.

1st. Fruit tree culture by seedling selections, in even this age of horticultural acquisitions from the remote past, rarely attains, in any region or climate, the highest degree of improvement from the continued grafting upon roots or stocks, from the first generation of seedling scions. Progressive improvements may be continued, as I am convinced by facts fully authenticated, by successive selections for at least two or three generations.

2nd. As a general practical rule, the best variety of fruit of every climate is produced only in the region where its parent stock first originated.

3d. *Illustrative.* The best apple of America and of the whole world is the Newtown Pippen, but it is best only in the region of country where it originated from a seedling tree. The Seckle—the best pear in the whole-world—best, although quite small, is best only in the region of country where it originated.

4th. Every kind of standard fruit always changes more or less in characteristics and almost universally deteriorates in quality when far removed from the region where it originated. Selected seedlings from such varieties may and generally do produce excellent kinds of fruit, where the fruit of the ancestral tree was worthless.

Illustrative Examples: The best varieties of apples now grown in our southern states originated from the seedlings of grafted trees from more northern states, which were first planted in the south, and produced there very inferior fruit. The best varieties of apples of the eastern states, where the trees or graftings thereof are grown in the northern states, produce in the western states fruit of the same names, but they are greatly deteriorated in quality. The best varieties of standard fruits in Europe become more or less denaturalized when removed to any part of America.

These brief remarks on *the improvement of fruit trees by seedling culture* are submitted to the enlightened judgment of the practical horticulturalists of this society. I will be greatly obliged to any of them for any criticisms or suggestions they may be pleased to communicate on this important subject.

A LADY'S SUGGESTIONS ON HORTICULTURE ON MINNESOTA PRAIRIES.

LINDEN FARM, LAKE CRYSTAL, March, 1884.

Oliver Gibbs, Jr.

DEAR SIR:—Please accept my thanks for a copy of the "State Horticultural Society's Report." I find it replete with interest and teeming with animation that speaks well for the society's future success.

It has been considered a doubtful question with the prairie farmers of Minnesota whether fruit growing can be made a success, but I am happy to say it is gradually being overcome. I do not think any prairie farm need be without its supply of fruit if the farmers will but take the pains to put out groves and hedges for protection against cold winds and storms.

We have around our garden as well as around many of our fields white willow hedges, and I find we are able to gather vegetables from our garden earlier in the spring than almost any one else in the vicinity, besides being protected much later in the fall from frosts. Last fall my tomato vines were green and loaded with ripening fruit when almost everybody else's was killed with frost.

I am sorry to say, there is too much of a disposition with the farming class to devote their entire time and energy to the care of their fields and stock.

The orchard, the garden and the yard are considered weak-minded topics, fit only for the consideration and devotion of women. I know farmers who will not spend a day's time in helping to arrange the garden, but if the poor, weary housewife, by dint of perseverence on her own part, and perhaps with the help of the children, succeeds in spading up a small piece of ground and raising a few vegetables, and when the hard-earned delicacies that should be relished only by those who have struggled for them, are at last brought upon the table, the "liege lord" will be first to help himself, without even giving a passing thought as to how they came.

I have often thought that instead of simply an apple sticking in man's throat, it is only a mystery how he has escaped the lodgment in the same region of a whole cabinet of specimens of the domestic fruit and vegetable kingdom.

Again I have seen men, women and children go three or four miles to gather little stinted wild strawberries.

To be sure, their flavor is nice enough, but they are so small, and the same amount of time spent in going for them and cleaning them would set out a bed of beautiful Bidwells, Manchesters or Captain Jacks in one corner of their garden at home, that would only require a small amount of attention and would always be handy to gather at their convenience. Three years ago we set out a bed of strawberries in our garden, simply for family use. We kept them weeded out that summer, and in the fall we put on a light mulch of chaff, and the next spring I was astonished to find with a family of nine or ten using all we could possibly get away with without foundering, that at the end of the season we had sold $25 worth. The following spring proved to be a very unfavorable season; however, aside from all we needed for family use, we again sold fifteen dollars' worth, making in all forty dollars' profit from this little bed. The same spring I set out a new bed and last spring we got some very nice berries from it. Last fall I potted some Bidwells and Manchesters and set them out. The weather proved so dry and unfavorable that I am waiting anxiously for spring to see the results. No one can realize the loss of these little delicacies until they have once had them in abundance.

We have been feasting all winter on our stock of canned plums, raspberries, currants, jams and jellies, and I would say for the benefit of lovers of raspberry short-cake that it is quite as delicious made of canned raspberries in dead of winter as in their prime season.

Another point, farmers are too apt to be negligent in the care of the grounds surrounding their buildings. Now, of all places, I think the farmer's home should be made comfortable and attractive. I do not mean expensive buildings and adornments, but simply comfortably well arranged buildings and neatly kept yards and lawns. It does not take very long to get the yard seeded in blue grass, and set out some evergreens, hard-maples, box elders, rock elms and cottonwoods, promiscuously or in groups that will render your home beautiful and attractive.

I have been so situated that I have not had much time to spend in out-door flower culture, but I always have quite a collection of greenhouse plants, and as early in spring as the weather will permit, I take the storm sash and enclose the porch exposed to the east, which is some 18 or 20 feet long, and arrange my plants there for the summer. I train my vines over the weather-boarding and hang from the ceiling a variety of baskets here and there. I arrange my pots on shelves and stands to the best advantage with reference to light. After this is done they require very little attention, further than to give them a refreshing shower bath every morning with the sprinkler, and I must say I have never seen handsomer plants in a greenhouse or elsewhere. Last summer I had one geranium that had thirteen clusters on at one time.

I hope I may not be considered presumptuous in offering the above suggestions. I have seen so many country homes so perfectly barren of trees, fruits and flowers, that the cheerless aspect made my very heart ache. I do not think we have more than half fulfilled our mission here on earth unless we have tried to make our paths those of pleasantness and our homes a haven of rest.

MRS. S. E. CURRYER.

SMALL FRUITS AT SHAWANO.

SHAWANO, WIS., Aug. 3, 1883.

We have good success in small fruits, most of them growing indigenous to the soil, and some, I think, that you do not produce—especially the Blueberry, which is a distinction from the Huckleberry or Whortleberry and far superior, although nearly resembling it in appearance and size. They afford quite a revenue to the Indians on the Menomenee Reservation, who alone engage in gathering them, and one day this week they marketed over 800 bushels. First with us, of wild fruits, comes the Strawberry, the Blueberry, Raspberry, Huckleberry, Blackberry, and Cranberry late in fall. I am safe in saying that in a good Blackberry season, there are not less than fifteen thousand bushels that are left unpicked up the river from here, within 25 miles, for the lack of market in which they can be profitably handled, as we are isolated from railroad connections, and they will not so well stand carting over rough wagon roads as some other fruits.

When our projected "St. Paul and Eastern Grand Trunk R. R." is completed through this county, we shall be able to give Minnesota a taste of our surplus good things, fruit-wise.

W. S. WOOD.

FERTILIZING vs. POLLENIZING.

We need a new word in horticulture, or else an agreement as to the use of an old one. Here is one Professor publishing a paper to illustrate the influence of particular manures on certain crops, and he calls it "fertilization." Then we have the phrase "commercial fertilizers." All right according to the dictionary. But here comes another Professor to tell us about the sexual characters of plants, cross-breeding, hydridization, etc., and when he comes to speak of the agency of the pollen of flowers, he gives us "fertilize" and "fertilization" to mean something entirely different. Why not say *Pollenize*, or *Pollenization*, and have a bye-law to that efect, and leave the other word to apply exclusively to the enrichment of the soil? Either this or a new word. This is referred to the American Pomological Society, the American Association for the Advancement of Science, and the American Association of Nurserymen, Seedsmen, and Florists. Let us have a law on the subject—and vote any man a bore who violates it. G

THE CAUSE AND PREVENTION OF DEVASTATING FLOODS.

There can be but little doubt but the yearly increasing floods in the Ohio river are rendered more frequent and severe from the fact that all its main branches have been, to a great extent, stripped of the forests through which they formerly flowed. The Alleghany, the Kanawhas, the Big Sandy, all these have had their forests stripped away and the soil can no longer retain the rain and water formed by the dissolving snow, and the immense amount of water falling upon this great area of country slides down the steep hill sides and into the river channels at once. As the tributaries meet and join each other the task to hold and bear them onward is more than the Ohio can bear and its banks are overflowed, and wide spread damage and disaster must follow. It is a well understood fact that forests protect the country adjacent to them from destructive floods, and also from severe droughs. In Europe this is so well understood that for many years past the governments of Germany, Austria, and Italy have been spending immense sums of money in planting millions of trees on waste lands on the head waters of the rivers, and are restricting by severe means the destruction of the remaining forests. The time has fully come when something of the kind should be done in the United States.—JOHN N. MURDOCK, *in Wabasha Herald, February 24.*

FRUIT TREES IN LYON COUNTY.

In the last ten years I have set upwards of 300 apple trees in Lyon county, and not one has died from climatic causes.

MARSHALL, Sept. 17, 1883. J. W. BLAKE.

AMENDED CONSTITUTION AND BY-LAWS OF THE MINNESOTA STATE HORTICULTURAL SOCIETY, AS PROPOSED AT THE ANNUAL MEETING, JANUARY, 1884.

ARTICLE 1. This society shall be called the Minnesota State Horticultural Society, and shall have perpetual succession.

ART. 2. The object of the society shall be to improve the condition of horticulture and arboriculture by collecting and disseminating correct information concerning the culture of such fruits, flowers and trees, and other productions in horticulture, as are adapted to the soil and climate of Minnesota.

ART. 3. The officers of this association shall consist of a president, one vice-president, a secretary and treasurer, and as many directors as there are congressional districts in the state, who, together, shall form a board for the general management of the affairs of the society; provided, however, that the control of all affairs of the society shall remain in the hands of the members at any meeting thereof, to be resumed and exercised by the board only *ad interim.* The officers shall be elected annually by ballot at the annual meeting. Said board or the society at any regular meeting may adopt such by-laws as may be deemed necessary for the society and not inconsistent with the constitution and the laws of the state of Minnesota, and may change the same from time to time at any such meeting.

ART. 4. The president, or, in his absence, the vice-president, or, in the absence of the latter, any member of the board who may be selected as acting president, shall preside at all meetings of the board or the society, and the presiding officer shall be for the time being the chief executive officer of the society, and authorized to sign all vouchers relating to the business of such meeting.

ART. 5. The secretary shall keep an accurate and full record of the proceedings of the society. He shall carry on correspondence with such fruit growers, florists and horticulturists in general as manifest an interest in the purposes of the society. He shall be ex-officio delegate to the American Pomological Society, to State horticultural societies of states adjoining Minnesota, and to the

Mississippi Valley Horticultural Society, with such other delegates as may be appointed.

He shall search with reasonable diligence for new and useful sorts of fruits, plants and trees, obtain them as far as practical for exhibition at meetings of the society, and collect and distribute for trial and propagation cions, seeds and plants, under such regulations as the board or the society shall make. He shall incur no expenditure of a large or doubtful character, except with the sanction of the board or the society. He shall compile and edit the annual report of the society, and shall attend to its publication and distribution; and for his services he shall be allowed a reasonable compensation.

ART. 6. The Treasurer shall have charge of the funds of the Society, and pay them out only upon the order of the Board or the Society upon vouchers signed by the President or acting President and the Secretary. He shall make up a full and true report of all receipts and disbursements of the Society, and present the same to the Secretary on or before the tenth day of January, in each year, or at any other time when called upon to do so by the Board or the Society. His annual report shall begin and close with the calendar year. He shall give bond in such sum as the Board or the Society may direct, to be approved by the President or Acting President, and the Secretary, and said bond when so approved shall be filed with the State Auditor, and it shall be renewed yearly for each term of office. A copy of the bond shall be filed with the Secretary of the Society.

ART. 7. The Members of the Society or of the Board present at any meeting thereof shall be a quorum for the transaction of business.

ART. 8. Any person may become an annual member of this society, on payment of the sum of one dollar, or a life member, on payment of ten dollars, and all membership fees shall be first paid to the Secretary, and by him be immediately paid into the hands of the treasurer.

ART. 9. Honorary members for a time stated or for life, may be elected at any meeting by a two-thirds vote of the Society, and they shall be entitled to all the rights and privileges of membership, except voting for officers; but this shall not be construed to prevent any person from joining the active list by paying the membership fees.

ART. 10. The fiscal year shall commence January 1st, and end December 31st.

ART. 11. This Constitution may be amended at any annual meeting by a vote of two-thirds of the members present, provided that notice of proposed amendments shall be presented and lay over one day before a vote on the adoption.

BY-LAWS AS PROPOSED AT THE ANNUAL MEETING, JANUARY, 1884.

1st. The terms of all officers of the society shall be one year and until their successors shall be elected and qualified; except a retiring secretary, who shall hold his office till the 1st day of July, after the election of his successor, in order that he may officially prepare and superintend the publication of the annual report for that year.

2d. Meetings of the board may be called at any time by the President or Acting President and Secretary, and it shall be their duty to call such meetings whenever requested to do so by a majority of the board.

3d. The annual membership for the previous year shall cease on the first day of the annual meeting, and before the election of officers.

4th. No person who has not been actively identified with the Society for three years at some time during the period of its existence shall be eligible to the office of President, Vice-President or Secretary.

The foregoing draught for an amended Constitution and By-Laws was referred to the following committee, to report at next meeting: J. M Underwood, R. J. Mendenhall, Wyman Elliot, A. W. Sias and G. W. Fuller.

COLONEL ROBERTSON AND DOCTOR WARDER— A COINCIDENCE.

Forty-two years ago, Col. D. A. Robertson was the editor of the *Elevator*, a weekly journal published at Cincinnati, devoted to agriculture, science, political and social economy; and in the eighteenth number, issued March 19th, 1842, he introduced Dr. John A. Warder to the world as a writer on scientific subjects. The following is the paragraph in which the introduction was given:

PROFESSOR WARDER.

"We are happy to be able to announce to our readers, that Professor Warder, of Cincinnati College, has kindly consented to become a contributor to the scientific department of the *Elevator*. Several communications from the Doctor will be found on the first page of the present number. The well known abilities and acquirements of Professor Warder amply qualify him for the office of an instructor. Though a professional gentleman, he feels deeply concerned in the elevation of the masses. 'The Ice Period of the World' is an intensely interesting article. The Doctor's aid will greatly enhance the value of this journal."

In a note to the Secretary, inclosing several copies of the *Elevator* of 1842, Col. Robertson says:

"Dr. Warder was the Professor in the Medical College of Cincinnati, and became afterwards proficient in horticulture. We traveled over nearly the same track in various studies. A coincidence: That we should, after so many years, gain like honors from the Minnesota Horticultural Society."

The readers of our report will be glad to observe that the Colonel has lost none of his old time interest in topics of popular education —his mission still being that of an elevator of his race—and that his pen retains its facility, vigor and grace of expression.

We are promised for our next annual meeting a paper or lecture from him, giving the gathered treasures of his scientific studies in horticulture, winnowed by the best judgment of his riper years.

CIONS DISTRIBUTED TO EXPERIMENTAL STATIONS MARCH 29, 1884.

NAME AND RESIDENCE.	Ostheim Cherry.	Red Plum	Green Plum	Rimbacker Apple	German RamboApple	Robinson Seedling.	Whetstone Apple.	Bel	Wright's Wint. Sweet.
Prof. E. D. Porter, Minneapolis	5	4	3	4	4	4	5		4
Peter M. Gideon. Excelsior	5	4	3	4	4	4		4	4
Underwood & Emery, Lake City	5			4	4				
L. E. Day, Farmington	5			4					
Barnett Taylor, Forestville	5		3					4	4
E. H. S. Dartt, Owatonna	5		3	4	4	4		4	4
J. S. Harris, La Crescent	5	4	3			4			
A. W. Sias, Rochester	5	4		4	4	4		4	
G. W. Fuller, Litchfield	5	4		4	4	4		4	
O. M. Lord, Minnesota City		4	3						
M. Pearce, Northome				4	4	4			
Total	45	24	18	32	28	28	5	24	24

All the foregoing, except the Wright apples are the contributions of Charles Ludluff, of Carver, delivered to the Secretary at the annual meeting in January.

The cions of the Wright apples, are the contributions of the grower, James Wright, of Minnesota City, cut by the secretary in February. These cions are sent out for trial, and for redistribution through the State Horticultural Society, of such as prove to be adapted to their new locations.

For a description of these varieties, see report of Charles Ludluff on fruits grown in Carver county, page 203 of this volume, and the seedling fruit report of J. S. Harris, page 359; and for a list of experimental stations with names of superintendents, in full, see page 256.

CHESTNUT GROWING NORTH OF 44°.

At the Green Bay meeting of the Wisconsin Horticultural Society, December 20, 1883, mention was made regarding a lot of seedling chestnut trees that were growing successfully in Waupaca county, nearly as far north as latitude 45°, and on my return I succeeded, with the aid of postmaster A. L. Hutchinson, at Weyauwega, in that county, in finding the address of the grower, Mr. Bennett, who furnished the following particulars about the trees:

The seed was obtained from Groton, Mass., and planted in the year 1858. The next year the young trees were transplanted to fence corners. There are ten of them growing on Mr. Bennett's place, all in good condition, and being now 26 years old. The soil is sandy, with gravelly clay subsoil. Temperature fell, at Weyauwega, last winter as low as 40° below zero. Accompanying the following letter from Mr. Bennett were samples of sound wood cut from the trees above mentioned.

LETTER FROM MR. BENNETT.

Weyauwega, Wis., Jan. 9, 1884.

Oliver Gibbs, Jr.

DEAR SIR:—A reply to all of your questions would take more time than I have at present. However, I would like to say a few words.

My experience in growing chestnuts would be to get your seeds as far north as they will be mature before the frost opens the burs. Keep them moist till the following spring, but do not let them mould. Plant in drills, cover about two inches deep, make as much growth the first year as possible. Mulch the ground around the roots, winters, till some of the roots have gone below the frost line. When they do not make a good growth the first year, take them up in the fall, heel them in the cellar, and set out in the spring.

I have never lost any Chestnut trees by frost or cold winters.

My trees are 25 to 35 feet high. They are 10 to 15 inches in diameter, and bear well. I have no trees to sell.

ALVIN S. BENNETT.

P. S. I have some seedling apple trees that stand our 40° below zero, and the fruit is good.*

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* Mr. Bennett's seedling apple orchard is described by Mr. Springer in his report on the Waupaca Seedlings. See page 196. SECRETARY.

HENNEPIN COUNTY HORTICULTURAL SOCIETY.

This Society was organized February 16, 1884, and meets the last Saturday in each month at two o'clock p. m., at the Market House, Minneapolis.

OFFICERS:

President..............M. PEARCE, Minneapolis.
Vice-President..........C. L. SMITH, Minneapolis.
Secretary...............WM. H. BRIMHALL, St. Paul.
Treasurer..............HENRY F. BUSSEE, Minneapolis.

EXECUTIVE COMMITTEE:

The foregoing officers and

J. S. Gray, Minneapolis; Geo. S. Woolsey, Minneapolis; E. M. Chandler, Minneapolis; Wm. Lyons, Minneapolis; G. H. Roberts, Minneapolis.

Membership is open to all persons interested in horticulture, and visitors are cordially welcomed.

Up to this date the following papers have been read. and the subjects treated therein discussed at the meetings:

"Trees, Seeds and Plants and their Adaptations to Soils," by M. Pearce; "Strawberry Culture," by William Lyon, "Shade and Ornamental Trees," and "Fertililization of Strawberry Blossoms," by C. L. Smith; "Currants," by J. T. Grimes, and "Raspberries," by M. Pearce.

The meetings are well attended and are growing in interest.

WM. H. BRIMHALL.

Minneapolis, March 28, 1884.

REPORT OF THE DELEGATE TO THE IOWA HORTICULTURAL SOCIETY.

Mr. President and Members:

I have again been privileged to attend the annual meeting of the Iowa State Horticultural Society. The meeting was well attended by substantial representative men of one of the best and most progressive states in the Union.

Delagates were in attendance from Wisconsin, Illinois and Kansas, to whom were extended the usual courtesies.

The last year has been a very disastrous one to the fruit interests of Iowa. The reports of directors from all parts, except the southwestern portion, show a very light crop of fruit of nearly all kinds, varying usually from half a crop to a total failure. These valuable reports also show widespread destruction of trees in orchard; twenty-five to thirty per cent, of all orchard trees being killed outright or virtually ruined. It may be regarded as a singular fact that this destruction was greatest in the southeastern part of the state, where the mercury went to about forty below, and seventy-five per cent. of trees are reported ruined, some entire orchards being destroyed on low lands, whilst on high lands the injury was proportionally less according to altitude. The greater destruction in this section is undoubtedly due to the fact that further north more attention has been paid to the selection of hardy varieties. Nursery stock and young orchards have suffered but little, whilst orchards ten to fifteen years out are injured worse than older trees.

The variety that has suffered worst of all is Ben Davis. Some will replant this variety on account of its good record in the past, whilst others will discard it entirely.

In the southwestern portion of the state, but little injury was done. A few trees were killed, the number increasing towards the north. The fruit crop in this section was generally good.

There seems to be quite a difference of opinion as to the cause of this general destruction of trees. Some believe it is not the extreme cold that kills, but the sudden changes towards spring. Others think the condition of the soil as to moisture at the setting in of winter has an important bearing, abundance of moisture being a favorable condition. All agree that hardier trees are a necessity, and that to obtain long keepers of the best quality, extensive experiments must be carried on. And in view of this fact they voted to ask for an annual appropriation of $2,500, in addition to the $1,000 they now receive, believing that a state rich enough to build a two million dollar capitol, can well afford to devote this small sum to promote so important and valuable a branch of industry.

The President's address was brimfull of good practical suggestions and the lectures and essays were mostly admirable productions in plain English, there being scarcely a reminder that the authors knew a little Latin and desired to make the most of it.

It occurs to me that in sending delegates to adjoining states where climates are less rigorous than ours, our greatest benefits must accrue from adopting such of their methods as are superior to our own and avoiding such as retard. In my last report I mentioned Iowa's plan of districting the state and electing a director for each district. My observation at this meeting confirms me in the opinion that with the combining of the reports of two or three of their twelve directors in one to save repetition as recommended by their President in his address. We may adopt this plan with great advantage to our state. The programme seemed remarkably full, requiring the constant effort of their able and energetic President to put things through on time.

* * * * * * * * *

E. H. S. DARTT.

[Other portions of this report are reserved for the action of the society.—SECRETARY.]

RUSSIAN APPLES.

As pioneer fruits for the cold northwest, I prefer the Russians to the crabs or hybrids. 1st. They average larger. 2d. They are less subject to blight. 3rd. They are generally better in quality. 4th. Are better stocks to graft the common apple on. 5th. Will sell much higher on the market. I propose to hold fast to the Russians till we originate something more profitable from seed. We fruited forty varieties the past season, among them four or five of the Anis family, as hardy as our native oaks.

Revel Pear apple, Red Transparent, Russian Green, White Pigeon, Leipzig, Borsdorf and many others are very fine in quality and extremely hardy.

Wm. Forster, of our county, showed us four White Astrachan trees that look promising; they said the crop the past season was about sixteen bushels, which was a good showing for trees of their size. This variety is said to be of Russian origin and imported into England from Sweden in 1816, with the Red Astrachan. I am unable to say why it has not been cultivated more; it appears to be more hardy and a better bearer than the Red Astrachan. Mr. Cottrell, of Dover, speaks well of the Round White, and White Pigeon. For top working with winter varieties of the common apple, I would suppose the Red and Yellow Anis would be superior to most anything else, owing to their extreme hardiness.

Sidney Corp, of Wabasha county, has the Yellow Anis in bearing, and speaks well of it. We can market many of the Russian apples before the middle of August; this enabled me the past season to put up enough previous to the great gale of August 21st, to take the sweepstakes premium at our fair. A. W. SIAS.

COL. ROBERTSON'S ESSAY OF 1867.

[The Minnesota Horticultural Report of 1873 being nearly out of print, the essay of Col. Robertson referred to in previous pages is herewith republished in compliance with numerous requests from members of the society.]

CLIMATOLOGY IN ITS RELATIONS TO FRUIT GROWING.

An essay read at a special meeting of the Minnesota Fruit Growers Association, St. Paul, January, 10, 1867, by Col. D. A. Robertson, of St. Paul.

The object of the Minnesota Fruit Growers' Association is to promote in Minnesota the profitable cultivation of valuable fruits, varieties of which have already become naturalized to the more southern latitudes of our country.

The importance of this enterprise is made apparent by the fact that more fruit is consumed by the American people than by the inhabitants of any other temperate climate. The consumption and demand increase faster than the supply. The popular taste is rapidly improving. The fondness for fruit growing is becoming a characteristic of our people, who are not content to make a permanent home where the choice fruits of the North cannot be grown.

The attempts, hitherto made in our state to raise apples, pears and plums have, we must acknowledge, resulted in almost universal failure. Few trees of these fruits have survived the third year after planting—probably not more than one in three hundred—perhaps not more than one in five hundred. Mr. Stewart's success in raising seedling apple trees may be taken as an average, one tree in ten thousand of his seedlings survived to maturity.

It is not surprising, therefore, that an opinion generally prevails, that Minnesota is too far north for the successful cultivation of apples, pears, cherries and improved varieties of plums.

It is consequently of the first importance that we should ascertain whether or not, we are within the zone or limits to which the cultivation of these fruits is confined.

That we are in the zone of the fruits named, facts, I think, demonstrate. Our failures have been doubtless owing to want of experience in cultivation, to want of proper adaptation, and to lack of knowledge in selecting varieties.

The essential conditions of temperature to insure success, are a sufficiency of heat in the growing season to ripen the fruit and of subsequent cold to force hibernation—or compel the tree to stop growing without killing it. Our summer heat is sufficient; our winter cold too intense, for most of the varieties we have tried.

I venture the proposition that in any climate where the summer heat is sufficient to ripen the fruit of any given kind, that there are varieties of trees of such fruit, *or new varieties may be originated*, which will withstand the winters and seasonal extremes of temperature in such climate.

The fruits named have been carried by civilized man in his migrations from milder climates northward. The change in the constitution of the tree has been gradual. *Naturalization from mild to much colder regions has been accomplished by the production of new varieties*, the essential characteristics of which have been earlier ripening of the fruit, and greater hardiness of the tree to enable it to endure severer cold or greater differences of seasonal temperatures.

It is a mistake to suppose that trees adapted to a southern climate and requiring a long growing season, can ever be acclimated to one much shorter.

As a general rule applicable to our continent, every additional degree northward shortens the growing season about four days. Our season at St. Paul is therefore twenty days shorter than that of Philadelphia.

Some varieties of fruit which ripen at Philadelphia must fail here in consequence of our shorter growing season.

But length of growing season is not the only condition—every variety of vegetation requires for its maturity of leaf or fruit a certain sum of heat. Wheat, for example, requires, according to the observations of Boussingault, from 2,000 to 2,200 degrees of heat, centigrade, which, with a mean temperature of 20 degrees centigrade, would require from 100 to 110 days to ripen.

But, in ascertaining the requisite quantity for plants growing exposed to the sun, the thermometer consulted should also be exposed to its rays. This is the approved method of observation, which, when applied in our climate, will, I think, give results highly favorable—showing that the solar heat of our growing season is sufficient to mature all early varieties, not only of the fruits named, but of peaches, also.

Our mean summer temperature is greater than that of Paris, in the vicinity of which all the fruits named are cultivated with great success.

The obstacle to our success in fruit growing, thus far, therefore, is our Russian winter climate.

The fruits I have named are cultivated with success in Russia. Pallas, who visited Moscow, near the close of the last century, states that these fruits were then cultivated in that vicinity, "and sold at reasonable prices."

Mentelle & Maltebrun, in their great work published in Paris, in 1803, give an account of the fruits cultivated in Russia, embracing apples, pears, cherries and plums. A variety of apples grown at Kervsk, they describe as weighing four pounds, of a delicious flavor, and keeping a long time. Another variety of apples grown in the vicinity of Moscow, which was brought from China, they describe as so transparent that when held up to the light, one can count the seeds in it. They state that in several of the districts of Russia, the exportation of fruits, and especially of apples, is an extensive branch of commerce—that the exportation of apples from the towns of Kalouga and Simbirsk, amounts to from 18,000 to 20,000 roubles annually; and that in some parts of Russia, the cultivation of the cherry for the manufacture of *Kirschwasser*, is carried on very extensively.

On the Volga and on the steppes of the Caspian, all the fruits I have named, including varieties of the peach, are profitably cultivated.

Xavier Hommaire de Hell, in his travels over the steppes of the Caspian, in 1838, describes a splendid fruit garden, owned by a Russian noble, at Clereofka, where he says "all kinds of fruits are collected here together. We counted more than fifty varieties of pears in one alley."

Adolph Erman in his travels through Russia and Siberia in 1840 mentions with surprise that he found at Torxhok, on the road from Moscow to Saint Petersburg, north of latitude 57 deg., and at Vladimir, north of 56 deg., that "cherries of a superior kind" were extensively grown and sold at a very low price.

There are also extensive orchards of apples at Vladimir, which is famed in Russia as a fruit region.

There are other continental or interior localities much further south of the places named, where from climatic conditions, the winters are intensely cold, and the summers dry and hot, from which we may procure varieties of fruit trees adapted to our climate. Of these I may mention Astrachan, and Russian Armenia, in which Erivan is the most celebrated for its numerous and extensive orchards and vineyards. The summers are hot, and I judge much like our own, but the winters so cold that it is necessary to cover the grape vines with earth to preserve them. My information on this subject is derived from the voluminous work of Montpereux, who visited that region in 1838. He states that there are there 1,470 gardens planted in vines, apple and pear trees, the sale of the fruit of which constitutes the principal revenue of the place. The same author mentions other places in the Caucasus mountain range between the Black Sea and the Caspian, where the fruits named are extensively cultivated, and where some varieties of wild grapes are equal to the cultivated varieties of France.

In Dr. Clark's Travels in Norway and Sweden, published in 1838, there is frequent reference to the excellent apples, pears and cherries found by the author growing in those countries.

He was much surprised and delighted with the horticultural improvements at Trondhjem in Norway, 63 deg. 25 min. north. He says, speaking of the town: "The houses are handsome, regular, large and airy, with pleasant gardens full of fruit and flowers, worthy of note in such a northern latitude, apples, pears, plums, cherries, strawberries," etc.

Surely these facts ought to encourage us to persevere in our efforts to obtain varieties of standard fruits adapted to our climate.

We must, I think, for entire success in our day and generation, procure by some means, for naturalization in Minnesota, varieties which thrive in the cold countries referred to, and especially from the continental or interior parts of Russia and Northern China, where the climate is like ours, not only intensely cold in winter, but also dry, as compared with maritime or lake coasts, and hot in summer, and the growing seasons of which are short like ours.

Apples are successfully cultivated in climates where the winters are far more severe than ours. Sir George Simpson, the late Governor of Hudson Bay Territories, gives in his Voyage Round the World, an account of his visit to Burnaul, Siberia, which is north of the Little Altai mountains, and of Northern China. He states as a fact that apples are cultivated there.

I have seen it stated that the Duchess of Oldenberg is of Siberian origin, from which country it was introduced into Russia. We have already ascertained that the Russians trace the origin of some of the varieties of apples they cultivate to China; and some of the travelers from whom I have quoted, state that the variety of apples they saw in Russia are unknown to other parts of Europe.

The Russians have maintained for more than one hundred and fifty years overland commercial intercourse with Northern China, which extends to the 50th parallel; and as the Chinese are the most skillful horticulturists in Asia, and probably the most ancient in the world, we may reasonably conjecture that many varieties of fruits growing in Russia were derived from Northern China, a portion of the globe about which very little is known. but which I have no doubt affords a magnificent field for horticultural exploration.

I have been able to find but one author, Pere du Halde, who gives an account of Northern China. Du Halde says the same kinds of fruits are raised there as in Europe, and particularly mentions apples and pears. This is in Manchooria, from which came the present ruling race of China, a race of very ancient civilization. The climate of Manchooria, is as hyperborian as that of Minnesota, and we may reasonably seek in that country for valuable varieties of fruits that could be successfully naturalized to our soil.

I think that our experience thus far shows that, as a general rule, the varieties of fruits best adapted to our climate must be obtained from the interior of continents where the climate is similar to our own.

We have been disappointed in our efforts to naturalize apple trees which grow in the Canadas even north of Quebec, and in Maine.

There has been, it is true, some success in varieties from those regions, but in fact, general failure. Success with them depends upon highly favorable circumstances, and the best methods of culture and protection.

For general success we need other varieties, which, like the Duchess of Oldenburg, are as hardy as our native forest trees.

We cannot be content to await the production of valuable new varieties, which may not be possible in a life time.

Our naturalized Duchess of Oldenberg is a fall apple, lasting but a short time. What an acquisition would we have in the Russian four-pounder, grown at Kirvsk, which is a winter apple, a great keeper and of superior quality. Its introduction would be worth millions to our Russian north.

Thomas Jefferson said that the person who introduced the Catawba grape conferred a greater benefit upon the country than if he had paid off the then national debt, which was considered vast.

How shall we estimate the value of the benefaction bestowed upon our people by the enterprising pioneers who shall succeed in introducing into general cultivation in Minnesota, varieties of valuable standard fruits, such as apples, pears, cherries and plums, which may be profitably grown for exportation as well as for home consumption. This is surely an object of great public importance. I believe that, however improbable it may appear, its accomplishment is possible, in our day and generation.

Is there not to be found somewhere in the North, at least one lover of horticulture, who has the necessary knowledge and the will to go and collect from the countries referred to, varieties of fruit trees for adoption here, and who has also what is essential—money enough to pay his way? Such a man who will thus devote himself to the public good, will confer incalculable benefits on our state, and entitle himself to the rank of a public benefactor.

[Editorial comments on the foregoing essay from the St. Paul Press, of January 11th, 1867.]

In our report of the proceedings of the Fruit Growers' meeting held last evening at the Court House, will be found an admirable paper, prepared by Col. D. A. Robertson, embracing in brief some of the results of the laborious researches of that gentleman, in what may be called the climatology of fruit culture, as applicable to the naturalization of apples, pears, cherries, and other staple fruits of the temperate zone in this climate. As a matter of fact it has been ascertained by costly experiment, that most varieties of fruit trees will not survive the winter climate of Minnesota, while some few of northern origin. such as the Duchess of Oldenberg, successfully resist the rigors of our winters. It is also a matter of fact, that in climates whose winters are as cold as ours, apples, etc., thrive well, but the experiment of introducing these hardy varieties from Lower Canada, northern Vermont or Maine, has also generally proved a failure.

But these failures have not disheartened Col. Robertson, who has an abiding faith that the apple may, in time, be educated to our climate, and that, in the meantime, there are many existing varieties, besides those already introduced, which are entirely adapted to our climate.

He assumes that these varieties may be found in analagous climates. This principle has been generally recognized by intelligent horticulturists, their only error being in regarding those climates as analagous where the winter temperatures, or, still more loosely, where lines of latitude correspond. But atmospheric moisture is almost as important an element of climate as temperature, and this principle of climatology has been very generally overlooked by our fruit growers.

Guyot divides climates generally into two classes, the maritime or oceanic, which cover the seaward slopes of continents with the humid atmosphere of the sea, and the interior or continental climates, where a dry atmosphere prevails, such as reigns over the interior plains of Asia and America.

Now, the climate of Minnesota is a blending of these two in summer; while in winter the arid interior atmosphere generally prevails. It is in a corresponding geographical situation in the Eastern Hemisphere, that we must seek for the climatic parallel of Minnesota, both as to heat and moisture. We long ago pointed out the striking coincidence both of temperatures and rain measures between the climate of Minnesota and Central Russia, and it is here that Col. Robertson is led by his researches in natural history to look for the apples, pears, plums, and cherries which are suited to the peculiar conditions of our Minnesota climate. The subject is one of such great importance as will justify practical investigation. For our own part, we do not in the least doubt that Col. Robertson has got upon the right track, and that not in Illinois nor even in Northern New York, nor in Lower Canada, but in the interior of Russia and Siberia, are to be found the nurseries which will supply our fruit growers with the future orchards of Minnesota.

EXPLANATORY.

Under advice from members of the Executive Committee the Secretary had solicited and obtained from the authors several excellent papers on general agriculture, read at the meetings of other societies during the past winter; but, it having been intimated that their publication in the Horticultural Report might be open to question by the Legislature as being unauthorized by law, it has been decided reluctantly to leave them out, and to limit the report strictly to matters of horticulture and forestry.

Among these papers, the following were and are believed to be of much value to Minnesota farmers:

"Minnesota as a Dairy State," by O. C. Gregg, of Camden, Lyon county; "Practical Truths by a Farmer's Wife," by Mrs. S. E. Curryer, of Lake Crystal, Blue Earth county; "Brains in the Dairy," by L. B. Hibbard of the *Farmer's Review*, Chicago—read at the Mankato meeting of the Northwestern Dairymens' Association; and "Wind as a Farm Motor," by C. D. Fox," of Beloit, Wisconsin—read at the February meeting of the Wisconsin State Agricultural Society.

Reports of the two societies mentioned, containing these papers, will be solicited in exchange, for the benefit of members of the Horticultural Society who may wish to read them.

THE LAW RELATING TO THE PRINTING AND DISTRIBUTION OF THE HORTICULTURAL REPORTS.

CHAPTER 8, GENERAL LAWS OF 1883.

AN ACT TO AMEND CHAPTER SEVENTY-TWO (72) OF THE GENERAL LAWS OF ONE THOUSAND EIGHT HUNDRED AND EIGHTY-ONE (1881,) RELATING TO THE STATE HORTICULTURAL SOCIETY.

Be it enacted by the Legislature of the State of Minnesota:

SECTION. 1. Sections one (1) and two (2) of chapter seventy-two of the general laws of eighteen hundred and eighty-one (1881) relating to the state horticultural society shall be amended so as to read as follows:

SEC. 1. There shall be annually printed and bound thirty-five hundred (3,500) copies of the annual report of the state horticultural society, provided the number of printed pages of the same shall not exceed five hundred (500); which report shall be transmitted to the Governor, and shall be distributed by the state horticultural society, as follows:

One (1) copy to each of the state officers, members of the legislature, judges and clerks of the supreme and district courts, county auditors and members of the board of regents and faculty of the State University; fifty (50) copies to the state historical society; one hundred (100) copies to the state board of immigration; one hundred (100) copies to the state agricultural society in exchange for a like number of its annual reports; and a sufficient number of copies to each county horticultural society to supply one copy to each of its members, provided, such county society shall be in active existence, and shall have filed with the Secretary of the State Horticultural Society a list of its officers, and committees and an abstract of its proceedings for the year preceding; and the remaining copies ahall be distributed by the State Horticultural Society, in such manner as it shall deem best, after retaining a sufficient number for its library and to supply future members and exchanges.

SEC. 2. This act shall take effect and be in force from and after its passage.

Approved, February 28, 1883.

THE LAW OF MINNESOTA ON FRUIT STEALING.

From pages 61 and 62, General Laws of 1867

An Act for the protection of fruit and ornamental trees, shrubs, vines, and vegetable productions.

Be it enacted by the Legislature of the State of Minnesota:

SECTION 1. That if any person or persons in this state shall hereafter enter the enclosure of any person, without the leave or license of such owner, and pick, destroy, or carry away the fruit, or any portion thereof, of any apple, pear, peach, plum, grape, or other fruit tree, bush, or vine, or any vegetable products, such person shall be deemed guilty of a misdeameanor, and upon conviction thereof, may be fined any sum not less than ten nor more than fifty dollars, and imprisoned in the county jail for any period not exceeding thirty days.

SEC. 2. That if any person or persons in this state shall wilfully and maliciously, and without lawful authority, cut down, root up, sever, injure, peel, destroy or carry away, any fruit or ornamental tree, or shrub, cultivated root, plant, or vine, of whatever kind, or any fruit or other vegetable production, standing, or growing on, or being attached to the land of another, or shall wilfully, and without lawful authority, cut down, root up, destroy or injure, in any manner, or carry away any fruit or ornamental tree, plant, shrub, or vine, upon any street, lane, alley, public highway, or public grounds, in any city, town, or village in this state, such person or persons so offending shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punished by a fine of not more than five hundred dollars, or by imprisonment in the county jail not exceeding three months, or both fine and imprisonment, at the discretion of the court having jurisdiction of the case, and shall, moreover, be liable double the amount of damages to the party injured.

SEC. 3. The penalties incurred by violation of this act may be enforced by indictment in any court having jurisdiction of misdemeanors in the county where the offence is committed, or the fine may be recovered in an action for debt before any justice of the peace of such county.

SEC. 4. This act shall take effect and be in force from and after its passage.

Approved March 9, 1867.

ADDITIONAL MEMBERS FOR 1883,

The following members paid their dues for 1883 after the report of that year went to press:

J. H. Bryant, St. Paul.
*E. H. Cuzner, Minneapolis.
John F. Gilmore, Richfield.
H. E. Lowell, Minneapolis.
A. R. Spaulding, Lake City.
†W. G. Henderson, St. Paul.
C. H. Cannon, St. Paul.
John S. Dore, Neilsoille, Wis.
J. C. Kramer, La Crescent.
R. Knapheide, St. Paul.
S. D. Richardson, Hampton, Ia.
W. B. Quinn, St. Paul.

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*Over-payment—refunded by order, dated Feb. 2, 1884.

†Over-payment—carried to list of 1884 without further payment.

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* Errata—page 13 for Summer meeting, 1884, read 1883.
" " 13 for Annual report 1884, read 1883.

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Errata, page 308, third line from the bottom, for "importature," read *importation.*

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*ERRATA—
Page 21, 3d line—for "Hodges" read "Bowen."
Page 51—add Truman M. Smith and M. Pearce to list of life members.

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